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OBSTETRIC HÆMORRHAGES.*

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Hæmorrhage, I consider to be the most alarming and dangerous complication of the lying-in room, with the possible exception of eclampsia. Its suddenness, the gravity of it in a few moments, make it a horror to contemplate. Were it not for the inherent property of contractility and retractility, which the uterus possesses, hæmorrhage would occur in every case of labor. It is this property which is lost when hæmorrhage does occur, and it is this which we endeavor to invoke in our efforts to check bleeding. Nature's ligatures, the muscular bundles surrounding the uterine sinuses, are temporarily paralyzed, the flood gates are open; the amount of blood which may be lost in a few moments is often enormous, coming as it does from venous sinuses of large size, covering the entire placental site and entirely concealed from view. To meet such an emergency as this the obstetrician should always have in readiness for instant use such safeguards for the control of hæmorrhage as are most rapid in their application and most certain in their results.

My own outfit to fulfill these indications comprises the following articles, which I make it a point to always have with me in my obstetric cases:

1. A fountain syringe, holding a gallon. (The most approved being Seabury & Johnson's "King Fountain Syringe," with a thermometer attachment in the side, where it is always in view.)
2. A long glass intra-uterine douche tube.
3. Three ounces of strong acetic acid in a glass-stoppered bottle with a safety screw cap above it.

*Read at the October meeting of the Homœopathic Medical Society of the County of New York.

4. Two packages of sterile packing gauze, 6x10 yards, for intra-uterine packing.
5. Needles for hypodermoclysis with connecting piece of tubing to attach to fountain syringe.
6. A long rectal tube for enteroclysis of normal salt solution.
7. Instruments for venous transfusion. (Scalpel, dissecting forceps, artery clamps (2), bulbous pointed canula, ligatures, needle and holder.)
8. One tube of sterilized normal salt solution (Van Horn and Sawtelle) for venous transfusion, and a small bottle or two containing each an ounce of sterile salt to make salt solution for enteroclysis.
9. Necessary instruments and suture material for the repair of lacerations of the perineum, vagina or cervix uteri. Especially one pair long artery clamps for controlling bleeding vessels of the cervix, and also a vaginal retractor.

It is my practice to arrange all the articles which may be required should hæmorrhage unexpectedly occur on a table where they can easily be reached without leaving the patient's bedside. These include a drachm of ergotole in an ounce of water, or a hypodermic syringe filled with ergotole ready for immediate use. A package of sterile gauze to be used as may be necessary to compress bleeding vessels about vulva, urethra or vagina. Sterilized instruments and suture material in a tray for the immediate repair of lacerations of the genital tract.

These apparently elaborate preparations for an emergency which is comparatively infrequent in the practice of a single individual, may seem quite overdrawn and unnecessary. But to my mind this is not so. It is attention to detail in any profession or in any business which commands success. Detail is a matter of habit, and it is a good habit to get into, to have thought out and prepared, not only a method but the implements to work with should an emergency arise which demands instant control. Our emergencies involve human lives, surely one, and, in obstetrical work, often two. We must act promptly and efficiently whether in the palace of the rich, or in the hovel of the poor, often with incompetent and insufficient assistance, and generally at a time when one's own strength is at ebb-tide from long hours of weary waiting and working.

Post-partum hæmorrhage is not such an infrequent event

after all. Edgar found in 2,200 cases of confinement 800 of which were out-door and the remainder hospital cases, that post-partum hæmorrhage occurred in 104 cases, or 4.72 per cent. This includes mild, severe and fatal cases. The frequency of the accident in hospital and dispensary practice was about the same. Mild cases occurred once in 22 labors, severe cases once in 550, and fatal cases once in 733 $\frac{1}{3}$ labors. Edgar admits that the great frequency of the complication in his series of 800 cases is due to the common use of the forceps, and to the mismanagement of the third stage. The physician who does not have constantly in mind during his attendance upon a woman in labor, especially during the close of the second stage and during the third, the *possibility* of post partum hæmorrhage with a clear comprehension of means to prevent as well as control it is not fit to practice obstetrics. Gooch, an English obstetrician of renown of the last century, truly said: "No physician should have the assurance or hardihood to cross the threshold of a lying-in chamber who is not thoroughly conversant with the remedies for flooding."

Allow me to express briefly some thoughts concerning the causes of post partum hæmorrhage. In the first place, I think it no exaggeration to say that this serious complication of the lying-in room is very largely a preventable accident. When one realizes the causes of hæmorrhage, predisposing and actual, he will understand how this may be true. For example, it is well known that albuminuria, anæmia, chlorosis and alcoholism, as well as diseases of the heart, which produce secondary venous stases in the lungs, liver, kidneys or pelvic organs, predispose to uterine relaxation and hæmorrhage.

How much can be done to correct these vicious tendencies by appropriate treatment every physician knows. If a patient is not seen until late in pregnancy and no opportunity afforded for such treatment, of course, nothing can be done in a preventive way.

Women who are worn out with frequent child-bearing should be strengthened by blood-making food, medicine and fresh air.

There is no question of greater importance to the welfare of mother and child than to decide when the use of forceps is indicated in protracted labors. If employed too soon, laceration of the cervix or vaginal strictures will occur with the inevitable hæmorrhage; or if there is too great delay with consequent uterine atony from exhaustion, equally dire results may ensue.

The *prolonged* use of chloroform is to be avoided, as it undoubtedly predisposes to uterine atony and hæmorrhage.

It is a cardinal principle in the conduct of the third stage of labor that the fundus uteri is to be guarded until contraction and retraction is assured beyond any question; efforts directed toward the expulsion of the placenta are not to be hastened until the placenta has separated from the uterine wall and is free at the os uteri or is in the vagina. Any infraction of these rules is liable to be followed by hæmorrhage.

Imperfect separation of the placenta can usually be attributed to improper management of the third stage of labor; exceptionally it may result from an abnormally intimate attachment of the placenta due to a decidual endometritis or some other morbid condition. The retention of isolated cotyledones or of a small supplemental lobe interferes with the normal contraction and retraction of the uterus in precisely the same manner as the partially separated placenta. Uterine atony is rarely primary, except when it follows excessive distension of the uterus as in twin pregnancies or hydramnios. Hæmorrhage from lacerations of the cervix, vagina, perineum, vulva or periurethral tissues is often quite formidable. If means are at hand to check hæmorrhage promptly from these extraneous sources the loss of blood need not be serious. The danger is that the source of the bleeding may not be detected because not looked for.

Continual bleeding in the presence of a contracted fundus always suggests an external origin, and search should immediately be made for its source. I have known most alarming and even fatal bleeding to occur from laceration of the cervix or lower uterine segment following the operation for speedy delivery in acute toxæmia with threatened eclampsia, and also following delivery by version for placenta prævia. Great caution should be exercised during extraction after version for placenta prævia, not to deliver rapidly as we are inclined to do, in the interests of the child, lest extensive laceration of the vascular tissues of the lower uterine zone takes place.

A source of bleeding, which happily is not common, but which, when it does occur, constitutes one of the most formidable complications, arises from an *inversion of the uterus*, which consists literally of a turning of the organ inside out and upside down.

I have seen three cases of *inversio-utero*, one in my own practice

and two in consultation. The accident occurs during the placental stage of labor. The hæmorrhage and the shock were profound. Severe pain, referred to the uterus, hæmorrhage and shock are three symptoms which, when taken together, are significant of either inversion or rupture of the uterus. If inversion has occurred, an examination externally will show a marked "cupping" or indentation of the fundus, which is due to the first step in the process of turning inside out. This may proceed to such a degree that the inside of the uterus with the placenta still attached appears in the vagina, or it may appear outside the vulva with placenta attached, wholly or in part. This was the case in the first *inversio-uteri* that I met with; the second was only a partial inversion, the fundus descending to the external os.

One of the most trying emergencies, hæmorrhage being the critical symptom, that I ever experienced was a case of inversion complicating placenta prævia seen in consultation. At the fourth month the patient met with an accident, falling from a chair, striking on her buttocks. A rather severe hæmorrhage ensued from which the patient recovered after keeping the recumbent position for two days. Two months later the patient had another hæmorrhage which ceased spontaneously. Placenta prævia was suspected and confirmed by feeling the placenta through the os. Six hours after the cessation of the hæmorrhage there was a sharp recurrence; a vaginal tampon including a firm tamponade of the cervix was applied; considerable blood oozed through the tampon, and when it was removed free bleeding occurred. Vorhees' bag was introduced, but dilatation was slow and bleeding continued. Manual dilatation was begun and consumed a whole hour in overcoming a rigid os. The placenta was then perforated and version attempted, but proved impossible on account of the tetanic condition of the uterus, absence of the liquor amnii, and the impossibility of reaching a foot without using more force than was justifiable. Forceps was applied in the absence of pain, not a wise thing to do under ordinary circumstances, but the only course available except to let the patient die undelivered. Blood flowed profusely. The child was born and hæmorrhage ceased. Again a hand was inserted to remove the placental remains, and the fundus was found in the vagina; it was returned, only to follow the hand down again, this time appearing externally. The shock of inversion added to the complete exsanguination of the patient was too much and the patient died a few moments later.

Hæmorrhage from premature detachment of a normally situated placenta (retro-placental hæmorrhage or accidental hæmorrhage). This also is a rare complication of pregnancy or labor. The causes are traumatism, such as a fall, or a blow, or riding over rough roads and albuminuria. The latter is the cause in most instances. A short, or relatively short cord, is a possible cause, and so is hydramnios. This form of hæmorrhage usually occurs in the latter third of pregnancy, or it may occur during labor. The bleeding occurs suddenly; the patient becomes excited, restless, feels ill, and has a tendency to swoon; the pulse is rapid and weak; the uterus quickly enlarges in consequence of accumulation of blood between the placenta and the uterine wall. To palpation the organ feels hard, tense—woody consistence of Pinard—regarded by him as pathognomonic of separated placenta. It is not common to hear the fœtal heart sounds. The gestation may continue to full term if the separation of the placenta is not too extensive. A case of partial detachment of a normally situated placenta I saw a number of years ago was caused by a stage ride over a rough mountain road. There was uterine pain, acute anæmia and syncope. The patient revived, resumed her journey homeward; the child died in utero, and was carried several weeks. Meantime the mother developed albuminuria and failed in health. Labor was induced and a large mass of clotted blood was delivered with the placenta, which plainly showed an extensive region of detachment. The mother fully recovered.

Placenta prævia. There surely can be no more trying emergency in obstetric practice than hæmorrhage from placenta prævia. It may be that the initial hæmorrhage is not so great, but it is the uncertainty which surrounds these cases that makes them so trying. One can never tell when the next hæmorrhage will come nor how severe it will be. The question immediately arises, is it safe to permit a patient with placenta prævia to go on under competent supervision, or is it best to interfere and terminate the pregnancy at once? There is the belief held by some practical men that partial placenta prævia is much less dangerous than the complete form. This may be so sometimes. But I am sure no rule of prognosis or treatment can safely be based on this assumption. I have seen the hæmorrhage as profuse when there was merely a portion of the edge detached as when a greater bulk was separated. I think the principle of treatment enunciated by Dr. Robert Barnes, of London, nearly thirty-

five years ago has never been improved upon, and is to-day a safe guide to follow. It is this: "If the pregnancy has advanced beyond the seventh month, it will, as a general rule, be wise to proceed to delivery, for the next hæmorrhage may be fatal; we cannot foretell the time or the extent of its occurrence, and when it occurs all perhaps that we shall have the opportunity of doing will be to regret that we did not act when we had the chance." I have occasionally deviated from this rule in the interests of the child, but only when the mother could be kept in bed and have the constant attention of a trained nurse, who has the skill and is provided with every requisite to tampon the vagina should hæmorrhage occur suddenly, or until such time as the physician could be summoned. But the risk is enormous and the responsibility very great. Undoubtedly the best way is to proceed to empty the uterus as soon as arrangements can be made to do so, providing for all emergencies.

There is no single method of treatment applicable to all cases. The practitioner who understands how to differentiate his cases will have the best results.

If the first hæmorrhage occur coincident with the onset of labor, and the cervix is patulous, insert one finger, strip up the placenta within reach, that is, separate the placenta from its uterine attachments and rupture the membranes with a probe guided by the index finger at the height of a uterine contraction. This will have the effect of checking hæmorrhage by allowing retraction of the uterine wall and closure of the bleeding sinuses, and at the same time will excite uterine contractions and expedite labor. If it is a head presentation let the case alone. Bleeding will probably cease. If it does not and labor is slow, introduce a Vorhees' bag or a Pomeroy bag, expand it and wait. It may be necessary to introduce the bag into the amniotic cavity after rupturing the membranes, or perforating the placenta, according as we have to deal with a partial or complete placenta prævia. Occasional traction should be made on the tube of the bag by means of the hand or steady traction by a weight. If labor is delayed, and the dilatation is complete, delivery by version and slow extraction is the proper procedure. If the head can be reached, that is, if it is engaged, forceps would be more conservative of the child's life and involve less risk to the mother than version.

Occasionally the first hæmorrhage will take place through a cervix so rigid and undilatable that it is impossible to introduce a Vorhees'

bag, of even a small size, or scarcely the finger. Any manipulation is impossible. In such cases, in order to control hæmorrhage temporarily, a tight cervical and vaginal pack of sterilized gauze would be indicated and would do good service. Bleeding will be controlled, and after a few hours sufficient dilatation will have taken place to permit of whatever treatment may be necessary; either the bipolar version of Braxton Hicks, or internal version; or, if neither of these procedures are considered wise, a Pomeroy or Vorhees' bag will control the situation and prepare the way for delivery. In general practice the method of Braxton Hicks, viz., bipolar version after sufficient dilatation to enable the practitioner to introduce two fingers, will be the procedure of choice. The average practitioner may not and probably will not be provided with reliable balloon bags, and he cannot wait to procure them. For such the bipolar version will have to suffice. In case of a dead child, this is the best procedure, as the child is not to be considered.

The treatment of placenta prævia hitherto has been based on an entire disregard of the child's life. The foetal mortality averaged 70 to 80 per cent. And by Braxton Hicks' method, 4 to 8 per cent. of the mothers were lost. The more modern method of treating placenta prævia by means of the rubber bags of the Vorhees or Pomeroy type is conservative of both lives, as in many cases it allows the child to pass through the pelvis head first, or, if version has to be performed, the way is opened by means of the bags for the extraction of the child.

Rapid manual or instrumental dilatation and extraction is to be earnestly warned against, lest extensive lacerations of the lower uterine segment, even into and through the broad ligament and through the cervix into the supra-vaginal tissues result. Even with the utmost care a tragic ending will occasionally ensue, and the mother and child will both be lost.

Cæsarean section has been successfully performed when the placenta was centrally prævial and the cervix tightly closed, and is considered from a scientific standpoint to-day as a perfectly justifiable procedure. Dr. Florence S. Ward, of San Francisco, read an essay, entitled "A Report of a Case of Cæsarean Section for Placenta Prævia," before the American Institute, and it was published in the *New England Medical Gazette* for October, 1909. Dr. Ward believes that this will prove to be a conservative procedure, al-

though, as she says, at first glance it would seem to be most radical if not unjustifiable. Up to 1904 the mortality of this operation in these cases, according to Deaver, based on 25 cases, was 20.8 per cent. for the mother and 66.6 per cent. for the child. Kronig, who believes that the great majority of patients die from hæmorrhage and but few from sepsis, advocates Cæsarean section for placenta prævia—at a time when the patient is in good condition, is not infected, and the cervix is partly dilated. Kronig performed six Cæsarean sections for placenta prævia during the past year. All the mothers left the hospital within three weeks; all the children were delivered alive.

Up to the present time bipolar version and the balloon bags offer the best chance to both mother and child in the hands of the average practitioner, both in the way of controlling hæmorrhage and promoting delivery. If hospital privileges can be obtained for a case of placenta prævia at the right time, that is, before acute anæmia from hæmorrhage results, and the services of a skilled operator can be secured, I believe Cæsarean section will in the future take an advanced position as a conservative operation in these cases.

Treatment of post partum hæmorrhage. The bleeding in post partum hæmorrhage is met by certain well-defined methods of treatment, the object of which is to secure permanent contraction and retraction of the uterus. For the predisposition to hæmorrhage in that rather unusual class of patients known as "bleeders," I know nothing which does so well as strychnia 1-30 grain doses, three times a day, during the last months of gestation. This remedy certainly helps to maintain a firm uterus after the placenta has been delivered.

Should hæmorrhage occur immediately following the birth of the child and before the delivery of the placenta, it may be assumed that the bleeding comes from a partially separated placenta. In this case the uterus should be stimulated by kneading. If this does not stimulate the placenta and produce contractions, hæmorrhage continuing, the placenta should be delivered manually.

Contractions may be maintained by one or other of the following means: Ergot, preferably ergotole, in 30 drop doses, hypodermatically. This drug requires 15 or 20 minutes to produce its full effect. When one is apprehensive that hæmorrhage may occur, as after a tedious labor terminated by forceps, the drug should be given

long enough before the delivery to produce its physiological effect at the time desired, as nearly as this can be estimated, *i.e.*, by the time the uterus is empty. Its use should be combined with vigorous friction over the fundus. Should it have been necessary to introduce the hand into the uterus to deliver the placenta, or remove clots, or in any case when the ordinary means like kneading and ergot is not sufficient to secure a satisfactory degree of contraction which appears to be permanent, an *intra-uterine douche* of a 2 per cent. solution of acetic acid and water of a temperature of 116° F. (not less) should at once be given. If hot water alone is used it should not be less than 116° or 118° F.. Too much time should not be given to friction, ergot and the douche. If hæmorrhage still persists, with a tendency to uterine relaxation, and the patient complains of nausea with unavailing desire to vomit and covered with a cold perspiration with anxious, quick, deep sighing respiration, I give *ipécac* in water, one teaspoonful every five minutes. This remedy may be given with good effect earlier, even when the placenta is retained and bleeding is present. Hæmorrhage with nausea and cold sweat are the symptoms which indicate *ipécac*, and I am sure it is of great benefit in these cases. If any further treatment is required I rely upon bimanual compression or intra-uterine packing.

Bimanual compression is of great value in controlling intractable hæmorrhage, and can be done as a preliminary to intra-uterine packing, or in place of it, at least as a temporary measure, while an assistant is getting ready for packing. Seize the fundus with the left hand through the abdominal wall, knead, compress and rub it vigorously with the fingers, grasping the fundus over the top so that the fingers are over the posterior wall with the thumb in front; simultaneously insert the right gloved hand into the vagina, pass it into the uterine cavity. If clots or fragments of placenta are present remove them; clean out the uterus completely; move the hand around on the inner wall of the uterus so as to irritate to contraction, continuing the kneading process outside.

Bimanual compression with one hand on the fundus, two fingers of the other hand under the cervix, or the whole hand in the vagina compressing the cervix upward against the pubic bone, while the hand outside doubles the uterus over on the hand within, is often an effective method, the organ being held in this position for a long time.

A piece of ice as large as a goose's egg may be rubbed over the fundus as a local stimulant, but do not use cold too long, as it is depressing rather than stimulating; a teaspoonful of ether poured upon the hypogastrium produces a quick effect by the sensation of intense cold produced on the skin. In order to reinforce the influence of the hand in desperate cases which have not yielded to previous measures, it should be remembered that a cut lemon introduced within the uterus and squeezed will produce quick contraction by virtue of the citric acid the lemon contains; ordinary domestic vinegar will act equally well. The lemon can be washed and rendered sterile by being immersed in a solution of bichloride of mercury for a moment, but not so with vinegar. It is better, however, to use these simple remedies and run the risk of infection than to allow the patient to die from hæmorrhage.

Intra-uterine tamponade. In cases of hæmorrhage which do not yield to the above measures, the tamponade of the uterine cavity is the only resource left. Iodoform gauze is best, as it keeps sweet longer. Seize the anterior lips with a Volsellum, draw it down, and have it held by an assistant. Place the left hand on the fundus, and with a pair of dressing forceps in the right feed directly from the sterile package into the uterine cavity, as much as the uterus will hold; the vagina should also be packed. Allow packing to remain twenty-four hours. When withdrawing do so slowly, allowing the uterus to contract down upon the tampon gradually.

If iodoform gauze is not at hand, do not wait, use anything clean that can be quickly obtained, as newly laundered towels, sheets torn into strips, the danger from infection being less than that from bleeding.

Hæmorrhage after delivery of the placenta though the uterus is in firm contraction comes from the cervix, vaginal tissues, vulva or perineum. Ergot and a firm vaginal pack will usually suffice to check such bleeding. If the circumflex artery of the cervix is torn, primary suture is the most surgical method of treatment, and likewise all serious lacerations of other structures.

Hæmorrhage from abortion is sometimes very sudden and severe, especially about the third month. But it is usually quickly over. If not, the tampon followed by emptying the uterus by means of the finger or curette is all-sufficient.

Anæmia following the severe hæmorrhages in obstetric practice is

often alarming. Stimulants should not be given at this time, that is in the acute stage. The heart is working on vessels that contain little blood. The more forceful the heart the greater the bleeding. Give *china* in water at short intervals. If patient is very restless and nervous give $\frac{1}{4}$ grain morphia, hypodermatically. This is quickly effective. Do not employ enteroclysis or hypodermoclysis until uterus is firmly contracted. When this is accomplished give a high enema of normal salt solution or direct venous infusion of the normal salt solution, or Ringer's solution into the median basilic vein, or a hypodermoclysis of eight to twelve ounces of a saline solution. In acute cerebral anæmia the patient may require constant care for many hours or days. In order to encourage the intracranial circulation the foot of the bed should be raised by blocks, and in extreme cases the patient's legs should be held in position above the bed by means of pillows.

Fresh air, artificial warmth, and china will do much to revive the waning powers. In extreme cases an intra-venous injection of fifteen minims to thirty minims of the officinal solution of ammonia diluted with an equal quantity of water often causes prompt reaction.

The later after care should consist of absolute rest, deprivation of society, and the frequent administration of small quantities of food and stimulants, the best preparation being egg-nogg made with one-half to one ounce of brandy to each glass (eight ounces). The patient should not take much at a time—a half ounce or so every half hour to an hour. No limit can be placed on the quantity of nutriment which may properly be given a collapsed patient, provided too large quantities be not given at once. The more they can be induced to swallow the better.

DISCUSSION.

DR. BUCHANAN: Dr. Danforth's paper shows that he believes that the prolonged chloroform anæsthesia is sometimes the cause of postpartum hæmorrhage. I do not believe that. It is not so much prolonged anæsthesia as deep anæsthesia that has caused hæmorrhage. For that reason I believe that light anæsthesia is all that is necessary and all that is safe.

The practice that prevails with some physicians of allowing the nurse or the husband to administer an anæsthetic is almost criminal. When you get it deep enough to relax the muscle fibres you

have the hæmorrhage. Another point about hæmorrhage: If you use chloroform in incomplete abortions I believe that the anæmia or exsanguination is one of the contraindications for chloroform. I have never yet used it in such cases that I did not have to watch the patient very closely. Ether is much safer in these cases.

SOME RECENT ADVANCES IN THE SCIENCE AND ART OF INFANT FEEDING.*

By J. T. Simonson, M. D., Professor of Pediatrics.

While the recent advances in the science of the artificial feeding of infants have been very rapid, the great bulk of the profession have failed to practice the art in a manner which takes advantage of the increased knowledge.

This failure or reluctance to make use of valuable material is probably due in part to the belief that the subject is too complicated for the daily routine of general practice, and also to the fact that many believe it to be largely a matter of theory, which is of doubtful practical value.

Much of this opinion arises from mistaken ideas as to the complexity of the percentage method of milk modification drawn from a hasty perusal of the recent editions of works on pediatry, in which a mass of figures, equations and formulæ gives a very abstruse, complicated and theoretical appearance to what is really the most simple part of the whole subject—a mere matter of a very little elementary arithmetic, most of which can be carried out mentally.

This view leads to the neglect of a method of preparation of the infant's food, which, while not by any means chemically and mathematically exact, is enough so for all practical purposes.

Furthermore, percentage modification is the only way by which we can put to practical daily use the many advances in our knowledge of the complex metabolism of infancy, and, more important still, of the various diseases of digestion and metabolism which form so large a proportion of the diseases of infancy and early childhood, and contribute so large a share to the death rate.

Until recently the prevalent idea has been that the proteids were responsible for most of the injurious results of feeding cow's milk,

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and it was mainly to escape these results that the proprietary foods were introduced. In these the nutritive element is almost entirely carbohydrate.

When the harmful results of giving the proprietary foods were recognized, it became necessary to devise some means by which the fats could be raised after the whole milk had been diluted to reduce the injurious proteid to a safe point.

To this end milk and cream, whey and cream, and top milk mixtures were brought into use, and percentage methods of modification were devised to make their application as methodical and exact as possible. But the almost universal concentration of attention on the methods of increasing the digestibility of the proteids and overcoming the digestive disturbances due to them caused the fats to be very largely neglected, and it was taken for granted that many of the bad effects really due to fats, were due to proteid.

At present, although our knowledge of the complicated chemico-physiology and chemico-pathology of the fats in digestion, assimilation and metabolism, is far from complete, enough has been gained to show that they are a much more frequent cause of disturbances of digestion and actual disease than was formerly supposed, and since this has been recognized much better results are being gained in the dietetic treatment of several nutritional and gastro-intestinal diseases.

A number of years ago Dr. Westcott, of Philadelphia, demonstrated that a large number of cases of intestinal catarrh and malnutrition were due to excessive fats in the food or poor fat digestion on the part of the infant, and showed the value of a low fat or fat free food in the treatment.

Since then it has been demonstrated that to successfully treat a number of nutritional and digestive disorders, such as acute ileocolitis, persistent vomiting, infantile atrophy, chronic intestinal dyspepsia, and many cases of simple gastro-intestinal dyspepsia, the fat must be lowered or entirely eliminated for a time at least.

I do not mean to underestimate the value and necessity of fat in a normal child's food. It is one of the three great elements of all food, and its caloric value, 9.3 to each gm. as compared with 4.1 for the protein and carbo-hydrate, shows its relative value as a heat and energy producer; but the recognition of its possibilities of harm in a certain class of cases has been much delayed, and is even now disputed by one prominent pediatricist.

The excess of volatile fatty acids in cow's milk is one of the reasons for its greater difficulty of digestion with the resulting decomposition in the intestinal canal and the production of large amounts of acids.

Steinitz and Czerny have shown in a series of valuable studies that most of the bad results of excessive fat feeding are due to the prevention of proper metabolism of the *alkaline* mineral salts; the fats using up so much of the alkaline in the formation of alkaline soaps in the intestinal canal that they are prevented from reaching their normal destination in the body.

This results in the increased production of ammonia to neutralize the acid products of metabolism and the ammonia, appearing in the urine in greatly increased quantity, is a valuable indication of over-fat feeding.

The explanation is certainly very ingenious. But even though the theoretical explanations may be as yet insufficient to make clear all of the bad results of excessive fat feeding, the knowledge drawn from experience is plain and well defined.

The practical application of this knowledge is comparatively simple. In the great majority of cases of infantile malnutrition and marasmus, intestinal digestion is so weakened that the handling of fats is almost impossible, and feeding a low fat or even fat free milk, in a large number of cases, has been of such great value that I have come to use it almost as a routine measure.

The milk used is skimmed and diluted with a dextrinized wheat or barley gruel, or plain rice gruel if the malt causes looseness. If the proteid digestion is poor, it is well to add peptonizing powder to the bottle as it is warmed, just before feeding. In extremely weak digestion, a mixture of whey and gruel is sometimes all that can be tolerated.

As the condition improves, the amount of skimmed milk is gradually increased until the child is receiving the maximum amount of proteid, (or dry stools, not of fat origin have appeared); then very small amounts of fats are added by using a higher bottom milk, that is, taking a little less top milk off.

As soon as this is well digested, the amount of fat can be cautiously and very gradually increased by using higher bottom milks until whole milk is being diluted, and, if improvement still continues, it may be possible to further increase the fats by using top milk

mixtures. But the increase must be made very slowly, as relapses with acute intestinal toxæmia, green stools, and fever are very common if the fat is pushed too rapidly.

It is astonishing to see how low the body temperature will become in these cases of low fat assimilation. Of course, many of them are hopeless without breast milk, which is the ideal diet for them, even though it must frequently be largely diluted; but as in the great majority of instances, especially those in the hospital, wet nursing is impossible, I have been obliged to depend entirely upon artificial feeding.

In a fairly large number of cases treated in Flower Hospital during the last few years, the favorable results with this method of feeding have been marked.

When vomiting is present, or the child is too weak to nurse, gavage is invaluable. It is simple, easy of application, harmless and an extremely valuable aid in many cases, although so little appreciated and practiced by the bulk of physicians.

Other measures, such as Keller's malt soup and alcohol, are part of the well understood treatment.

In colitis, acute and chronic, the same general principles apply, and the same general method of handling the fats is of great practical value. Many of these cases are absolutely poisoned by fats.

When milk feeding is begun after subsidence of the severe acute symptoms, absolutely fat free milk will be tolerated when any fat at all would produce marked symptoms. But even then, not more than two to four teaspoonfuls, once or twice per day, can safely be added to the gruel.

The general method here is the same as in the treatment of marasmus.

The important point is to throw the bulk of the digestive work upon the stomach with a proteid feeding, using in older children meat broths, junket from skimmed milk, skimmed milk, whey, etc.

In chronic intestinal dyspepsia the most marked good results are gained by a low fat diet, many cases being successfully treated in this way which would, by any other plan, be extremely difficult to handle.

I have a little patient, now four years of age, who is a brilliant example of this method of treatment. Although perfectly healthy in every other way, she cannot take more than two per cent. of cow's milk fats without producing marked symptoms of fat dyspepsia.

Although not of as wide use as low fat feeding, the modern use of lactic acid milk is of very distinct value in the treatment of diseases of the digestive organs in infants and young children. Its good results are probably due to a number of factors, such as the small amount of fat usually used, the presence of lactic acid, the changes produced in the proteids, and the presence of the lactic acid bacillus (Bulgarian), which has been shown to be markedly antagonistic to most intestinal micro-organisms, especially the putrefactive bacteria.

Although introduced years ago in Europe, little practical use was made of it until 1907 when buttermilk feeding was enthusiastically taken up by a few men here.

My first experience with ordinary buttermilk was very disappointing. It seemed to add to digestive disturbances in many cases, and children tired of it very rapidly, while gain in weight was small.

But an article in *Pediatrics* two years ago led me to read up all I could find on the subject, especially on the investigations of Cohendy, and instead of ordinary buttermilk I have been using a lactic acid milk made with the various preparations of the Bulgarian lactic acid bacillus. The results have been, not merely encouraging, but extremely gratifying in quite a number of cases; far superior to those gained with buttermilk, and in many cases superior to results gained by any other method of feeding.

After reading an article by Dr. Le Grand Kerr, of Brooklyn, in the January, 1909, number of *Pediatrics*, I have used the lactic acid in a large variety of cases, along lines indicated by him, and with still more encouraging results.

In every case the milk was modified and adapted to the age and condition of the patient before souring by the lactic acid preparation.

Usually I have used a pasteurized skimmed milk soured by the ferment lactyl or lactone tablet. In the latter case, adding one tablet to each quart of milk used, as recommended by Dr. Kerr.

Unless prevented by new conditions arising, I have tried to give each case a trial of two weeks at least, and have kept some infants on it for much longer periods.

Although the principal good results, as shown by Cohendy, Herter, Coombe, and others, are found in cases of fermentative diarrhœa, excellent results were produced in cases of acute and chronic

intestinal indigestion, ileo-colitis, and in several cases of severe mal-nutrition.

It is far superior to buttermilk prepared with gruel and sugar as advocated a few years ago, especially as the ordinary market buttermilk is an extremely unreliable product.

While the subject is as yet too new for clear cut indications and limitations to be stated, the results gained make me feel that I have another valuable resource to fall back upon in the class of cases mentioned.

In conclusion, I want to say a few words about the caloric method of infant feeding.

Much that has been written about it is very misleading as to its practical value, as it fails to take into account the adaptability or digestibility of different foods or the various elements of food, such as fat, carbohydrates and protein, or their value as tissue builders, and it is practically useless, when used by itself, as a guide in the selection of food for any given case.

But when the quality and character of a food formula have been settled for any given case and prove successful from a digestive standpoint, the caloric method is of considerable assistance in determining the total food requirements of the infant, based upon its weight, and frequently shows where the fault lies when an apparently normal child fails to gain weight.

In Germany it is being used almost to the entire exclusion of percentage feeding, while in this country the reverse is true; the caloric method being almost entirely neglected.

As usual under such circumstances a judicious combination of the two methods is the most practical course.

Although the subject is too extensive to be taken up at this time, I may say that I am convinced that very little practice is necessary to make the caloric method a valuable aid in the feeding of infants whose nutrition is below par.

A paper, entitled "A Convenient Method for Determining Caloric Values of Formulas, Based on the Percentage Method of Feeding Infants," and read at the 1909 meeting of the American Medical Association, will be of some assistance in the practical application of the method.

The last edition of Chapin's "Science and Art of Infant Feeding" gives a short but practical article on the same subject.

There is so much yet to be learned about the digestion and assimilation of the infant that each definite advance, however slight, may prove of value in the management of some one class of cases which have heretofore proven very discouraging.

46 West 85th Street.

COAL-TAR AND ITS DERIVATIVES.*

By G. C. Birdsall, M. D., Washington, D. C.

Because of the urgent demands upon it, industrial chemistry has developed into a great science during the past fifty years. Physicians, artists, dentists, dyers, bacteriologists, chemists, decorators, and, in fact, nearly all the trades rely, to a greater or less degree, upon the products of the industrial laboratory.

The field is so large and the productions so numerous that I shall consider only a few of those relating to our own profession.

When coal-gas first became of general use as an illuminant in the early part of the nineteenth century, the ammoniacal liquor and tarry substances depositing in the receiver and mains were considered waste products and their disposal involved considerable expense. Wood-tar had previously been used as cheap paint for external wood and metal work and it was only natural to suppose that coal-tar might answer the same purpose, especially as it was a by-product and very cheap. It was soon discovered, however, that a better preparation was produced if the tar was boiled. But in boiling, an inflammable gas was formed, and in order to avoid explosions it was boiled in a retort and the gas collected and condensed. This product was known as naphtha and found to be of much greater value to the paint maker than turpentine, which had been the solvent formerly used. In 1858 systematic investigation of the distillation of coal-tar began and it was found that many substances were produced which could be used as a basis in building up the numerous compounds now recognized.

The search for new drugs in distant lands and among the savages is no longer necessary. The synthetic chemist seems to be able to produce anything excepting life itself. In the tar-barrel have been

*Read before the Chiron Club, of Washington, at its November meeting.

discovered fifty thousand and more organic compounds and every passing day sees the introduction of one or more new ones.

Coal-tar is a complex mixture of many different substances. These various compounds boil at different temperatures, and when heated the compounds distil over in the order of their boiling points. This separation is not absolute, but approximate, and the distillates are redistilled until absolutely pure. From the first boiling, four distillates are saved :

1. Light oil, 100° to 210° C.
2. Carbolic oil, 210° to 240° C.
3. Creosote oil, 240° to 270° C.
4. Anthracene oil, 270° to pitch.

Light oil contains benzene, toluene and xylene, which are separated by careful fractional distillation. With nitric acid, benzene and toluene form nitro-benzene, or oil of bitter almonds, and nitro-toluene respectively, which form the basis for chemical substitution. Xylene is used in the rubber industry possessing the property of dissolving rubber. Xylol is used by the pathologist to dissolve Canada balsam and for clarifying tissues before mounting.

Anilin is produced by reducing nitro-benzene or nitro-toluene with iron filings and adding dilute hydrochloric acid, after which it is separated by distillation. The various colors are produced by the action of oxidizing agents upon this basis. Among those commonly used in medicines are eosin and methylene-blue, used for staining tissues, blood and bacteria; fuchsin, which shows special affinity for the tubercle bacillus; Bismarck-brown, gentian violet and methyl-violet of service in staining and differentiating bacteria.

Previous to coal-tar distillation, benzoic acid was derived from the gum benzoin. Now it is being made from toluene in large quantities. When ingested, benzoic acid is eliminated in the urine giving it a deep color and offensive odor. It is of value in rheumatic and gouty conditions and often indicated when colchicum fails.

Hydroquinone and resorcin are made from the benzene ring. The former is used in developing photographic negatives, the latter is used as a local application in eczema, psoriasis and seborrhœa. It is stimulating and antiseptic and softens the dried scales.

Dimethyl-amido-azo-benzole, Congo-red and alizarin used as in-

dicators in the examination of stomach contents are derived from coal-tar. Nearly all of the perfumes and aromatics are now being made from coal-tar products formed by combinations with benzene or toluene. Coal-tar saccharin, which is probably the sweetest substance known, is of service in diabetes, as its ingestion does not increase the amount of sugar in the urine.

The second product of distillation is known as carbolic oil. This contains carbolic acid and other phenols, naphthalene and other oily hydrocarbons. This distillate is thoroughly shaken with alkaline water, which dissolves the carbolic acid and phenols and the naphthalene and oily products rise to the top. The water is then drawn off, acidified and the carbolic acid separated by distillation.

Salicylic acid is produced by heating the dry sodium salt of carbolic acid in an atmosphere of carbon dioxide. It is similar to benzoic acid, both in its molecular construction and in its effect upon rheumatism. Locally it is used to soften callus or to remove thickened epithelial patches on the skin and is also useful in checking excessive perspiration on the hands and feet. Because of its irritating effects upon the stomach, salicylic acid has been supplanted by two of its salts, menthyl salicylate or oil of wintergreen and phenol salicylate or salol. Methyl salicylate is being used extensively in the treatment of muscular rheumatism, both internally and externally. Salol is used in rheumatism and myalgia, both alone and in combination with phenacetin. It has proven an effective intestinal antiseptic and controls many forms of intestinal fermentation.

Picric acid is obtained from the action of nitric acid upon anilin and is the oldest artificial yellow dye. In the laboratory it is used to precipitate albumins and in surgery it is used externally as a dressing for burns. Homœopathically it is indicated in brain-fag, muscular debility and sexual neurasthenia.

Phthalic acid, derived from benzene, when combined with phenol produces phenolphthalein. As an indicator of acidity or alkalinity, this substance far surpasses litmus in its delicacy. It has been introduced as a laxative and is used in from one to two grain doses. It produces a watery movement without pain or discomfort.

Acetanilid is obtained from the action of glacial acetic acid upon anilin. It was used as an antipyretic to a great extent, but its heart

depressing properties were so great that it has fallen into disuse. In continued doses, it produces weakness, dyspnoea, cyanosis and palpitation. The cyanosis is probably due to the liberation of free anilin in the blood. I quote a well-known authority, as follows:—"Acetanilid should not be used as an antipyretic. Like all coal-tar products its employment as such is dangerous. Not only is a rise of three or four degrees of temperature harmless, but modern investigators tend to show that it is one of nature's means of defense against pathogenic elements of various kinds. The many cases of marked depression that have followed its use even in moderate pyrexia of infectious fevers have caused its use to be abandoned." It is absolutely contraindicated in typhoid fever and phthisis pulmonalis, as it tends to depress vital energy, which should be sustained as much as possible.

Penacetin, which is the oxy-ethyl-acetanilid, is considered much safer than acetanilid as an antipyretic. It is also an analgesic, its anodyne influence being much more marked than acetanilid. As such it is found in headache powders, neuralgia remedies and other pain killers. It is commonly combined with salol and prescribed for the relief of muscular rheumatism. The action of phenacetin is slow. In the first and second hours after its administration there is little reduction of temperature, while during the third hour the temperature reduction is marked. The heart depression is not as great as produced by acetanilid, but its administration should be guarded, especially in typhoid and enteric fevers, phthisis pulmonalis and cardiac diseases.

Antipyrine, another coal-tar product, acts somewhat similarly to acetanilid and phenacetin, as regards its power of reducing temperature. Antipyrine is the most dangerous of the three, however, because the dose does not always determine the effect, as some persons are much more susceptible to its poisonous effects than are others. As it is eliminated by the kidneys, it should not be given to anyone suffering from nephritis. It is likewise contraindicated in arteriosclerosis. Both phenacetin and antipyrine often produce eruptions of urticarial-like wheals on the skin and blebs on the mucous membranes. I am of the opinion that these three remedies—acetanilid, phenacetin and antipyrine—are used too promiscuously by the profession at large without taking necessary precautions regarding the

condition of the patient's heart and kidneys and that a great amount of damage has accrued therefrom.

It will be recalled that the third distillate contained creosote oil. From this group, many disinfectants are produced—cresol, tri-kresol, lysol, creolin and others whose antiseptic properties are well-known to you. Commercially, the creosote oil has proven of great value as a wood preservative and timber treated with it will resist decomposition for a long period of time. The creosote and guaiacol which are used as medicines are derived from the distillation of beach-wood tar.

Adrenalin is now being made by substitution in the benzene ring and its effects are identical with the natural product.

During the past year several synthetic products containing arsenic have been brought to the attention of the profession and used extensively in the treatment of malaria and syphilis and as a prophylactic measure following removal of malignant growths. The preparation most commonly used is known as atoxyl. It is the acid sodium salts of arsenic acid in which one hydroxyl of the acid has been replaced by one molecule of anilin. By means of this preparation, a much larger amount of arsenic can be administered and assimilated than when Fowler's solution is used.

Sodium cacodylate, an organic arsenic preparation, is being used to some extent in the treatment of syphilis. Its action is somewhat similar to that of atoxyl.

Ehrlich has recently produced an arsenic combination with the benzene ring known as dioxy-diamido-arsenobenzol, commonly known as "606," which promises to revolutionize the treatment of syphilis and make it as amenable to the action of arsenic as is malaria to the action of quinine. The salt as produced at present is strongly acid and has to be neutralized with sodium hydroxide before it can be injected. Owing to its instability, it is put up in vacuum tubes. One injection of 0.5 gram usually suffices to dry up syphilitic lesions and destroy the *treponema pallida*, though in some cases it has to be repeated. The product has not yet been marketed, but the numerous experiments now being made in this country and abroad are giving most satisfactory results.

THE PRESENT STATUS OF THE ÆTIOLOGY OF CANCER.*

L. Heitzman, M. D., Professor of Pathology.

About six weeks ago your President asked me to speak before this society on the subject he has indicated, thinking that it would interest every one. Being a somewhat busy man, I hoped he would let me off, but he insisted that I had promised. It has, however, been impossible for me to prepare a regular paper, so I will speak on the subject from a few notes that I have made.

Up to a short time ago all the medical papers were filled with articles on the cause of cancer. Probably no other individual subject was so much discussed. A short time ago, however, this was changed. Instead of reading about the cause of cancer, we now see big headings about 606. Now everything is 606, and the ætiology of cancer is, for the first time, forgotten. 606 is a very nice name, but you all know that the real name is not so short, and is paradioxydiamidoarsenobenzol. That you see, is a very nice name, but it has been proposed recently to change it to A. B. Z. (and to Salvarsan), so you can take your choice.

The discussion of the cause of cancer is about as old as the disease itself, yet even up to the present time there is no uniformity in the opinions of either practitioners or pathologists. Many years ago they thought they could readily explain the cause of the disease by calling it a tissue dyscrasia—a beautiful Greek word which, however, means nothing. By dyscrasia is meant a diseased condition of the liquids or fluids of the body. They thought that by giving a nice name to the conditions, just as the present beautiful name of 606, it would cover up their little knowledge of the subject.

About the middle of the last century the great pathologist of the nineteenth century, Rudolph Virchow, tried to show that there was a definite cause for the disease, and that that cause was irritation of some kind or other. He supposed and taught that cancer was caused by any irritation, either a single trauma, or by frequently repeated trauma. Furthermore, he lays great weight upon local dispositions. In these he includes direct hereditary transmission, places which had previously been diseased in some way or another, where

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the result of inflammatory conditions are found, and places which, on account of function, are prone to frequent disturbances or irritations. When, early in the eighth decade of the last century, bacteriology loomed up, it was only natural that cancer, such a frequent disease, was thought to be of parasitic origin, of some kind. This idea was, however, even then, say, thirty years ago, not new. Four hundred years ago the infectious theory of the cause of cancer was taught. John Hunter, one of the best pathologists of his time, placed cancer in the same category with syphilis, tuberculosis, small-pox, and other such diseases. Suddenly, in the early eighties, we were surprised by articles about the specific organisms of cancerous diseases, and in the ten or fifteen years following these articles became more and more numerous. Hardly an organism was not at some time or another supposed to be the specific cause of carcinoma. If I tell you that practically every known class of bacteria was included among these organisms, if I tell you that a fungus belonging to the class of mould fungo, the sub-class of schizomycetes was at one time found in cancer, and was considered to be the cause; at another time the yeast fungi, blastomycetes, was supposed to be the cause. Many of these forms were found in cancer and sarcoma, and both of these tumors were placed in the same category and were said to be produced by the blastomycetes.

Again, after a time, this theory was found to be incorrect, and different spirillæ, different bacilli, one after another received different names and were held to be the cause of cancer. All of these were sooner or later found to be of secondary origin, having nothing whatever to do with the production of the disease.

Living parasites of the lowest class next came, and these belong to the class of the protozoa, and numerous ones of this class were considered as the cause of cancer—spirozoa, coccidia, etc. One man wrote an enormous article about a coccidiaemia which he found in cancer, and with which he claimed to have produced cancer in the lower animals. For a time this was considered to be the cause, but again this theory was exploded before very long.

Within the last few years a change has occurred in the ideas of pathologists. While up to ten or fifteen years ago the best pathologists believed in the parasitic origin of cancer, I taught that it was not true that cancer was of parasitic origin.

At the present time an entire change has set in, and now very few believe in the parasitic origin of cancer. One of these is a man from Buffalo, and his theory is such a beautiful belief that,—I am sure some of you have read of it in the daily papers of last year;—I cannot refrain from reading excerpts from his article. It is a book of a hundred pages, with quite a number of illustrations. The book is entitled *Cancer and Sarcoma*. Dr. Walker arrives at the following conclusions: Not only does he believe in the parasitic origin of cancer, but he claims that his experiments, carried on for seven years continuously, show that the common earth worm is responsible for its propagation. He describes what he calls parasites in the cavity of the earthworm, and thinks that each species of worm harbors a different specie of parasite belonging to the protozoa. His conclusions are that many herbivorous animals contract malignant disease from eating vegetables infected by earthworms crawling over them, leaving the parasites of cancer and sarcoma. These soon enter the interior of the leaves, and when the infected vegetables are eaten the parasites are scattered through the system and enter upon their work of destruction. He further states that the boiling of vegetables for one hour does not kill these parasites. All malignant tumors can be avoided by refraining from eating vegetables, such as cabbage, celery, lettuce, etc. What do you think of that? All we have to do after this is not to eat any vegetables whatever, and cancer would be thoroughly eradicated. All that I have to say about this theory is that the parasites which he describes are undoubtedly nothing but integral cells, parts of the earthworms; besides that, he has undoubtedly found amoeba, secondary infections, and he depicts the amoeba in its different stages and calls it the parasite of cancer.

I think we can dispose of the so-called parasitic theory of cancer, after what I have said. I am certainly an absolute disbeliever in the parasitic theory of cancer. I believe that the bacteria belonging to the class of schizomycetes and blastomycetes are of secondary origin only, that the protozoa, including the classes of spiroidia, coccidia, etc., are nothing but degenerative changes of the nuclei which constantly take place in cancer. All of these are products of nuclear disintegration, all of them are products of the protoplasm of the cell itself. Now this has been proven by different cancer re-

searchers who, as you probably know, in the last few years have held numerous meetings in this country and Great Britain, and it is due to them that the parasitic theory is now believed to have been demolished.

The modern theories of cancer can be divided into three groups: The first one is the parasitic theory, of which I have spoken; the second is the so-called theory of cell anatomy; and the third is a rather new biologic study of the production of cancer, with its subsequent theories.

The second of the three is the theory of cell anatomy, the self-growth of the cells producing cancer, and I have to go back to what I mentioned a short time ago as being Rudolph Virchow's theory of traumatic origin of cancer. All of you have seen cases of cancer. Most have been impressed with the fact that the greater number of cases will give you a history of traumatism at some time or another, if you only call the patient's attention to it. I have here a splendid little paper by Dr. Dieffenbach called "Observations on the Etiology of Cancer," in which he states that after persistent questioning of the history preceding the time of the neoplastic growth the fact of a trauma was found in 90 per cent. of all his cases—and his paper is based upon quite a number of cases. If I remember correctly Dr. Dieffenbach says that several hundreds of cases were treated in the Flower Hospital and in his private practice. He further states that if the memories of these patients had been sufficiently retentive, probably all of them would have been referred to trauma in some form as the origin of the trouble. Some of these traumatic causes are very remote, and no significance is paid to many daily habits which can be placed under this classification. He cites a number of cases of this ten per cent. where he was able to elucidate a true cause for the origin, and where the patient originally denied any traumatism whatever. These cases can be multiplied *ad infinitum*.

It would seem that there is very little reason at the present time to deny this theory of trauma as being at the bottom of the cause of cancer. That we cannot invariably get at the direct cause is undoubtedly true. All of you know that cancer is very much more liable in certain individuals and in certain places where traumatism is more frequent than in others. Only a few of these need be alluded to. Cancer of the lip, for instance, is rather common in pipe smok-

ers; then other cancers of the mouth and of the throat in general are common in those individuals in which a constant irritation of some kind or other has been going on—decayed or broken teeth, ill-fitting plates, or constant chewing of toothpicks, etc. Then in the intestinal tract we find by statistics that cancer is much more frequent in people addicted to the use of alcohol—cancer of the œsophagus and of the stomach is found in those individuals more often than in others; cancer of the intestines and cancer of the rectum is quite common in persons suffering from chronic constipation, from hæmorrhoids, etc. The different causes of cancer due to irritation are so numerous that it is impossible to mention them all, but take two of the localities which we know are among the most commonly affected in human beings, the female breast and the uterus. Those who see a number of cases of cancer of the female breast have only, if they have not already done so, to question their patients closely as to any possible traumatism. Frequently you hear that “the head of one of my children has at one time or another bumped against my breast, so that I had intense pain for days or even weeks. A few months or a year afterward a tumor started to appear.”

In a subject like this it is useless to dwell upon individual cases, but it is interesting when I tell you that such a case developed in my own family. A young mother of twenty-six years, apparently perfectly well up to that time, suddenly one night had her breast injured by the bumping of one of her children's heads. Six months later she was dead of a malignant medullary cancer. The disease started within a month after this single injury, but in this instance it was absolutely referred to this incident. Such cases can be multiplied indefinitely. We all know that cancer of the uterus, be it the body or the cervix, is much more frequent in women who have had children, especially those who have had a lacerated cervix. I am sure the gynæcologists will bear out that statement. Further we know that calculi, whether in the bladder or the urethra, are liable to cause the development of a cancer. Quite a number of cases are on record where constant shaving with a dull razor produced the disease, or where the constant blowing upon a wind instrument was responsible. Again, the continual use of the urethral catheter, or the constant use of rectal syringes, are known to have produced the disease; that scars or warts may produce cancer, we have all seen. Furthermore, callosities on the hands, the wearing of tight belts,

friction from horseback riding, have all been known to cause the disease. Sunlight is another cause—where persons are constantly exposed to the rays of the sun. That brings us down to a more modern cause, the X-ray. Again I can refer to Dr. Dieffenbach's paper. He has seen not one, but a number of cases produced by the action of the X-ray, frequently repeated traumatism. That should be sufficient to give an idea of what lies at the bottom of the production of cancer.

A few days ago I found an extremely interesting little book by an Englishman by the name of Gibson, called "The Etiology and Nature of Cancerous and Other Growths." He propounds the following theory: "The incidence of cancer is greater in the neighborhood of sewage dumps and badly kept manure heaps. A high death rate has been associated with sewage contamination of the soil." He believes that the bacterial products emanating from the soil and possibly also those present in drinking water but not formed by the decomposition of sewage or manure, are great factors in the production of cancer. He believes that both decomposition and inflammatory products are direct agents in the causation of cancer. He is one of the comparatively few who has referred to the nervous impressed with the changes taking place in cancer of the ileum. He believes that the impairment of the control of the nervous system is responsible for a good many different instances.

Once more, I will take up Dr. Dieffenbach's article. He was impressed with the changes taking place in cancer of the ilium. He found that the nuclei of the cancers changed in such a way that new formations were seen in them—new formations that had long since been called endogenous new formations. He calls attention to the resemblance of cancer epithelia to the new cells found after irritation or pressure of some kind or other. We see in the urine of persons afflicted with hypertrophy of the prostatic gland certain peculiar formations, changes in the nuclei of the epithelia, which are undoubtedly the result of proliferation caused by pressure. We see the same condition in an abscess pressing upon the surrounding tissue—I refer now to abscess of the genito-urinary tract; we see the same conditions in the later months of pregnancy where an inflammation on the urinary tract has been going on, and where the epithelia of the different organs will, as the result of pressure, assume these endogenous new formations. Dr. Dieffen-

bach thought there must be some direct connection between the changes seen in these epithelia and the changes seen in the epithelia of cancer from time to time, and that the same sort of irritation and pressure was responsible in the one case as in the other. Furthermore, he believes, and rightly so, that changes in the nervous system take place, and that these changes help in the production of the disease.

There are a few little places that I would like to read from this article. He says: "May we not assume that the impulses inhibiting and controlling normal cell proliferation can be interfered with, while at the same time its nutritive supply may remain undisturbed?" He further says: "The writer feels convinced that cancer is due to changes in cell proliferation from inhibitive influences," and he gives the following conclusions, to which please pay attention, for I think he has made a great step in the right direction. "Neoplasms are due to interference with normal cell reproduction induced through trauma, pressure, severe inflammations, or constant irritations. These factors act upon the trophic nerves supplying the parts affected and prevent either through pressure, inhibition, or inflammatory changes in the nerves themselves proper, afferent and efferent impulses to the cells supplied by these nerves. When a trophic nerve is severed, degenerative changes are noted; when the trophic nerve is only partly destroyed or diseased, cell control is interfered with, and abnormal cell growth is invited."

Now that is only theory, but everything we know about the cause of cancer is theoretical and is bound to be theoretical. Yet when we note the numerous cases occurring after traumatism, when we note the changes taking place in the cells in the formation of cancer as well as in simple inflammatory conditions, and when we know that even in simple inflammations the nervous system, either directly or indirectly, is implicated—all pathological text books will tell you that,—I think we have come very much nearer to the truth.

Now I come to the last of the theories, if it may be so-called,—that is the biological study of cancer. Way back in 1870 experiments were made by inoculating different animals. At that time these experiments were unsuccessful; occasionally new formations were produced, but these new formations were found to be different from the original formations; many times nothing but a conglomerate

tion of new tissue producing a tumor-like formation known as granuloma. Several years since the inoculation of animals was taken up again by many different scientists, but up to the present time they have been successful in only three animals,—rats, mice and dogs. No inoculation in any other animal has been successful. Such tumors have been transplanted and carried through many generations, in one instance through no less than forty generations. It has also been found that the inoculability of certain tumors among the lower animals depends upon the viability of the tumor cells, and that the inoculation is a transplanting and not an infection, as was first believed, years ago. Since the new tumor grows from the transferred cells and not from the tissue of the host, the proposition of the successful transplanting in animals of the same species is the exception not the rule. Only from ten to forty per cent. of successful inoculations have been attained and a considerable number of animals has always been found,—mind you I am now speaking of the same species of animals,—immune. A true specific immunity in tumors has, at the present time, not been demonstrated. The methods employed involve a process of elimination of the weaker animals, which succumb, and some of the animals which appear to have been rendered immune by the vaccination may have always been naturally immune to the tumors. The artificial resistance against tumors does not appear to be specific, as far as experiments have gone, and up to the present time there has been no satisfactory evidence in the serum of the immune animals of a substance directly antagonistic to the tumor cells. The experiments are by no means conclusive.

Now you might ask how to explain the fact that certain persons, after a single injury, develop a cancer, while others, after the same injury, or after frequently repeated injuries, never develop cancer. I might answer, individual predisposition, individual susceptibility,—but would we be any wiser for that? What do we know of individual susceptibility or individual predisposition? Mighty little. We know, however, that there are certain inherent qualities in the germ cells, and these inherent qualities develop more or less constantly.

In presenting all these modern theories, I have purposely omitted a number of other theories which you might have expected to

hear about. I have not said a word about Cohnheim's theory of defective development. Why? I do not believe it. I do not think there is anything in it as regards cancer. Is it easy to imagine that certain cells have been placed prenatally in certain tissues—that is, that cells belonging to one layer of blastoderm should be placed in and develop from another layer of the blastoderm? It might be easy to account for that in a tumor which developed soon after birth, but it is difficult to develop such a theory in cancer when we know that the majority of cancers develop after middle life. The statistics show that the greater number of cancers develop between fifty and sixty years of age. That does not mean that cancer does not develop in young people. Unfortunately, it seems to me, that the development of true undoubted cancer has, of late years, taken place more frequently in young individuals than in former years. It is possible that we may have diagnosed it more frequently than before. I know of a number of children who have developed cancer. I recently had a case in a boy of fourteen who developed an epithelioma of the eyelid. Half a year ago this was excised by a specialist and given to a pathologist, who pronounced it an epithelioma. Not a month later the tumor again developed, was excised a second time and given to a second pathologist, who also pronounced it epithelioma. Within six weeks it developed a third time and was pronounced epithelioma. There was a boy, a poorly developed boy, who undoubtedly had a disease which we used to be taught was a disease of only old age. Not long ago a pathologist of this city sat down upon me bodily for pronouncing a case medullary carcinoma of the uterus in a young woman of twenty-four. He asked who had ever heard of such a thing as a cancer in a woman twenty-four years of age? Such a thing was impossible, and that the man who said there was a cancer there did not know what he was talking about. It required only three minutes to show this doctor that he was wrong, and that there was a medullary cancer of the most malignant type. I have just told you of a young mother of twenty-six who died in six months of cancer of the breast.

You all know about Ehrlich's side chain theory of immunity. It is impossible for me now to go into any discussion of this theory of Ehrlich, who is the same man who has developed the A. B. Z. This chain theory, however, is universally admitted to be the only

reasonable theory of immunity, be it natural or acquired. All of us know that some persons may be exposed for some length of time to a certain contagious disease without being infected, others will take it violently and others very mildly. Ehrlich's side chain theory with its receptors and its amboceptors accounts for this, natural and acquired immunity in many different cases, and it seems probable that it will account for the immunity of many individuals to cancer. We all know that toxic substances are produced by cancer,—by the cancer cells. What does the patient die of? He does not die of the disease, which is at first purely local, and yet in a short time he becomes as anæmic and cachectic as it is possible for a person to be. That must be due to some toxic substance absorbed in the blood. It seems reasonable to believe that Ehrlich's side chain theory will account for the fact that certain individuals contract cancer when they are injured, while others do not.

DISCUSSION.

One of the members inquired whether, in the case which Dr. Heitzman cited as occurring in one of the members of his own family, there had been any history of gastro-intestinal indigestion.

DR. HEITZMAN replied that he could not answer the question, as the case in question was that of his mother-in-law, whom he had never known, as she had died long before he married, and the history was given to him partly by her husband and partly by her physician.

Answering another query in regard to whether the boy who had cancer was a drinker of soda water, Dr. Heitzman said that the boy came from a poor family, and though he could not speak positively in regard to the matter, it did not seem likely that he could have been in the habit of constantly so indulging. He had inquired of the father of the boy whether he had suffered from indigestion, and was informed that the boy's digestion was as regular as possible.

AMPUTATION WITHOUT SCARS.*

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By Charles H. Duncan, M. D., New York City.

About two years ago the writer's attention was directed to what appeared to be a large percentage of defective or deformed stumps. His investigations as to the cause led him to the manufacturers of artificial legs as possibly the source from which he could derive some information on the subject. Knowing that they must necessarily see the stumps after the surgeon has finished with them and from the fact that they see them in such large numbers, my investigations led me to Messrs. A. A. Marks, and right here I wish to thank them for the courtesy extended to me in my investigations and the assistance they gave me in examining a large number of stumps, and of being able to question the patients.

The substance of my conversation with them on the subject is embodied in the following letter that is self-explanatory:

New York, Nov. 23, 1910.

Dr. C. H. Duncan,
233 Lexington Ave.,
N. Y. City.

Dear Doctor:—

To remove a mangled or diseased leg or arm, merely to get rid of an objectionable part, does not call for any more skill or surgical art than that required for the proper handling of the scalpel and saw, and the application of catgut, bandages, and antiseptic lotions or powders; but to perform an amputation so as to leave a stump as free from blemishes and defects as possible for the handling of an artificial leg or arm calls for more care and judgment than is usually exercised.

I feel that it is safe to say that fully 75 per cent. of the stumps with which I am conversant are subject to criticism in one way or another. The presence of long and broad *cicatrices* on the ends which are likely to be torn apart by contractile forces due to wearing artificial limbs, the adhesion of *cicatricized* tissues to bone, the presence of *cicatrices* on surfaces where contact with an artificial limb is necessary deprive stumps of all the most favorable conditions for artificial limb purposes.

I have been brought in contact with upward of 50,000 stumps. It is customary for me to examine and pass upon about on an average of ten a day, and if I state that one-half of them are subject to criticism due to *cicatricized ends and surfaces* I do not believe that I am over-estimating.

Insufficient healthy muscular tissue on the ends of stumps is unfortunate,

*Read at the Academy of Pathological Science, November 25, 1910.

but too much muscular tissue is equally as bad. There should not be any more tissue on the end of a stump than necessary to provide a good flap and to protect the stump and prevent the skin from adhering to the bone.

I have rarely found a stump covered with transplanted tissue a good one. It has been my hope that some method would be adopted by which transplanted tissue could be made as strong, as resistant and as firm as tissue natural in situ.

Respectfully yours,

A. A. MARKS.

Uncovering these important facts, in this rather peculiar way, was the incentive that caused me to make a thorough investigation of the subject. The result of my investigations is disclosed in the paper I am about to present to you this evening.

Amputations Without Scars.

In the broad field of medicine, possibly more than in any other branch of science, we are prone to follow traditions blindly. Conservativeness is dignified and enduring. It is holding fast to that which is good, but when conservativeness is not open to reason and improvement it completely clogs the wheels of progress, and approaches, in a sense, bigotry. To be conservative is not to cease to progress. It is the act of being certain that progression is in the right direction before its final acceptance. When an innovation is once accepted as better, or an advance in the right direction, it is adhered to tenaciously till something else is deemed more worthy of adoption.

In presenting this paper, the writer hopes to be met with true conservativeness or openmindedness, or a desire to weigh carefully the results he has obtained before passing judgment.

This article is written for the purpose of pointing out the reasons for the pain and deformity that are in so many stumps, and at the same time advancing an operative and post-operative technic that the writer has developed which, if scrupulously followed, will be the means of giving an ideal stump when the conditions are favorable.

The contents of this paper were developed in select cases from among 25,000 accident cases that came under the writer's personal medical supervision.

A cicatrix, or dense fibrous connective tissue, is the result of

irritation during the completion of the process of repair, for when the process of repair is accompanied by irritation from any cause the connective tissue cells are stimulated to the proliferation of new dense fibrous connective tissue.

The technic of the skin incisions and the wound dressing and drainage are the main factors that must be taken into consideration in eliminating irritation, and consequently cicatricial tissue in the wound. That all irritation cannot be kept out of a wound is apparent from the nature of the case, but clinical experience proves that it can be markedly reduced in all cases, for irritation may frequently be kept out of a wound to such an extent that there will be little or no dense, fibrous connective tissue in the wound whatever. In many operative cases of the writer a positive diagnosis of a previous wound could not be made after six months.

Irritation in Wounds.

First. *Infection* is one of the principal causes of irritation in a wound, but infection does not necessarily mean that the wound must be full of bundles of dense, fibrous connective tissue. The writer has dressed many burns of the third degree following the technic described in this paper with no resulting dense, fibrous connective tissue following.

Second. *Bandages.* Irritation is maintained in a wound by tight bandages. The normal swelling that follows an operation will often press the skin flaps so tightly against the tight bandage as to cause necrosis or sloughing of the skin flaps, which will, of course, necessitate healing by granulation, with its consequent tendency to dense, fibrous connective tissue formation.

The best results obtainable from granulating surfaces is the formation of a thin, pliable integument over the surface. This may be obtained in even extensive wounds, providing the granulating surface is enabled to heal with little or no irritation, or providing the granulating surface is allowed to heal in the manner described later.

Third. *Tight Sutures.* Irritation is maintained in a wound by too great tension on the skin sutures. The sutures will cut into the tissues, causing constriction anemia, with a consequent necrosis of the flap edges.

Fourth. *Insufficient Skin Flaps.* When there are insufficient

skin flaps to cover a wound, the healing contractions of the flaps will cause too great tension in the skin sutures, causing constriction anemia with a pulling open of the wound. This open area must necessarily heal by granulations. With its dangers of dense, fibrous connective tissue formation described above.

Whenever there is even a slight tension on the skin sutures, adhesive plaster should always be placed on either side of the wound and the two flaps drawn together by means of coarse silk thread placed in the edges of the plaster. The plaster should come within one-half inch of the edge of the flaps on either side and should go over the gauze that covers the wound in the interrupted sutures.

Fifth. *Sutures Retained Too Long.* Sutures left in the wound too long will set up an irritation with consequent dense fibrous connective tissue formation. For this reason sutures should be removed as early as possible. When the skin edges are accurately approximated and the flaps have been secured by surgeons' plaster, the skin sutures may be removed in from three to five days. The surgeons' plaster should be retained for two weeks or longer. If there has been much original tension in the sutures of the plaster it will set up an irritation in the wound sufficient to cause dense, fibrous connective tissue.

Sixth. *Sutures Too Large.* Irritation is also maintained in the wound by improper selection of the size of the sutures, or in attempting to control bleeding points near the skin with ligatures when other means would answer the purpose equally as well. All approximating sutures should be placed well below the cuticle for intracutaneous sutures are the direct cause of much irritation to the wound and subsequent dense fibrous connective tissue. Where possible place all sutures subcutaneous except those that are used in approximating skin edges.

Seventh. *Irritation of Ligatures in Severed Vessels.* The ends of vessels and ligatures left in a wound may tax the absorptive powers of the tissues and act more or less as foreign bodies and set up irritation. Bunching the tissues to cover the bone should be done guardedly with full knowledge that the constriction of the tissues, if not judiciously performed, will result in necrosis, thereby taxing the absorptive power of the tissues.

Necrotic tissue to be absorbed must be first in the fluid state, and

if there is much bunching of the tissues, and consequently a large necrotic focus, provision should be made in dressing the wound to have it escape in the drain. A necrotic focus in the tissue delays repair. It acts as a medium for infection, and more or less as a foreign body. It taxes the power of absorption.

Eighth. *Handling, Bruising or Wiping the Skin.* Irritation with its subsequent cicatricial tissue is maintained in the wound by improper handling, bruising or wiping the skin edges.

Ninth. *Adhesions of Dressing and Friction From Dressing.* When the gauze covering a wound becomes adherent there is a consequent removal of tender granulations at each dressing.

Irritation is maintained in the wound by friction or rubbing of the dressings.

Tenth. *Irritation From Antiseptics.* Irritation is maintained in the wound by too long or too strong use of antiseptics that come in contact with edges of the skin flap.

Eleventh. *Irritation From Muscular Action.* Immobilize the parts when muscular action will interrupt the adhesive process of the skin flaps during the process of repair.

Skin Incisions.

Epidermization or repair of the epidermis is brought about by:

First. Proliferation of epithelium around the wound margin.

Second. Proliferation from any part of the malpighian or lower layer of the epidermis that may be left.

Third. Proliferation from the skin appendage, the sebaceous and sudoriferous glands.

Skin incisions should always be made with the object in view of permitting an exact approximation of the skin edges during wound closure. Accurate approximation in all wound closures must be made even at the sacrifice of normal tissue, if the best results are to be obtained. If the elimination of scars is the object sought it is necessary for the wound to heal by first intention. Accurate approximation will result in the wound healing by first intention. If in addition to the wound healing by first intention we can cover the same with epithelium, an ideal condition will be attained, for it is a normal covering of the body. It is the tissue that will stand rough usage with the least harmful results. By following the tech-

nic outlined, the writer has often covered the wound with epithelium to such an extent that it was not possible to discover that there ever had been a wound.

All skin incisions should be made with a sharp instrument, and preferably with one downward sweep of the instrument. The plane of the skin incision should never be perpendicular to the surface if it is possible to avoid it.

In making a circular incision in amputations, the plane of the incision should incline downward at an angle of about thirty degrees, with the axis of the limb—that is, the cutting edge of the knife, is directed toward the distal end of the extremity, making the skin incision approximate a section of a cone with its base toward the stump. An incision of this kind does not remove the malpighian layer, or the appendages of the skin under the incision, but cuts through their ducts in such a manner that upon wound closure epitheliation takes place in the line of the wound itself from the duct of these glands from the malpighian layer under the incision, and there is also a tendency for the epithelia to bridge the incision from the edges of the skin flaps on either side. While it is not possible to keep all irritation out of the skin flap, yet it is possible for us to endeavor to keep it out, and by so doing reduce the relative amount of dense fibrous connective tissue in the wound.

Clinical experience proves that it is possible to markedly reduce irritation in all wounds, and in the majority of cases to such an extent that there will be little or no dense fibrous connective tissue present whatever. In exceptional cases, where irritation must be maintained in the wound, as in amputations of the breast, it is remarkable how little dense fibrous connective tissue there is present, even when the skin is stretched almost to the point of tearing after the wound is dressed in the manner described below.

Wound Dressing.

There is always more or less copious oozing following an amputation. Where this oozing comes in contact with the air or the dressing, coagulation takes place; that is, the solid elements of the blood separate from the serous or fluid elements and become hard and crusty. The serous element shortly takes on a gluey consistency and seals the solid parts of the blood to the wound, forming

a clot or scab, the thickness and hardness of which depends upon the amount and time of the oozing. The oozing from the stump soaks into the gauze dressing, and the gauze and blood combined partake of the consistency or quality of the clot; that is, together they become hard and crusty and are sealed tightly to the wound. This casement of gauze and clot around the end of the stump is unyielding and so hard and armour-like at times that it requires long soaking in a warm watery solution to loosen it. This casement is reinforced or held in its position by the bandage and the bandage at times is wrapped rather tightly around the end of the stump to control the hemorrhage. Even though the bandage is not particularly tight, subsequent swelling of the wound will increase its tightness and the wound will be sealed effectually.

There is about only one other way that coagulation could be hastened and assured, and that is by placing over the wound, at the close of the operation, the average dusting powder. The placing of dusting powder on the wound is practiced by many surgeons as a matter of routine. These powders are not selected with the view of hindering coagulation of the blood, but as a protective, or as an antiseptic or healing agent.

It is considered good practice today to have the wound dry; it is the object for which we strive, the result we wish to attain; it is the acme of success. Clinical experience, however, has demonstrated conclusively that the dry wound, or one where a clot is allowed to form over it, is not all that could be desired by any means if the result sought is the elimination or lessening of dense, fibrous tissue. The writer has demonstrated over and over again, thousands of times so, that it is long past the experimental stage; that a blood clot over the wound is the very condition that should be avoided. For certain it is that in all wounds and granulating surface where irritation is kept out of the wound by not allowing the clot to form in the manner described later the resulting dense, fibrous connective tissue is markedly lessened. *Contrary to prevailing ideas, clots are a great source of irritation* and of the subsequent dense, fibrous connective tissue in the wound. An extensive clinical experience has demonstrated this fact beyond all doubt.

The drain is removed after twenty-four hours. We are not certain that all the oozing from the tissues has ceased during this period, or that the fats and oils from the medullary part of the

bone have escaped. The oozing of the bone does continue often for several days following the amputation. After the drain has been removed, or after twenty-four hours, the clot at the drain opening soaks into the gauze and hardens, checking further free drainage. This oozing or exudate from the bone that is not allowed to escape by the clot forming over the wound interferes with the process of repair of the tissues in several ways.

First. By the tendency of the enclosed exudate to separate the parts by hydraulic pressure. The skin flaps from the muscles, the muscle layers from each other, and from the periosteum, and the periosteum from the bone.

Second. By depositing the solid, fibrinous elements of the blood between the different tissue layers.

Third. It defers healing by putting the flaps on the stretch.

Fourth. The enclosed decomposing fats and oils from the medullary part of the bone act as an irritant or a foreign body with its chain of evil consequences.

Fifth. The skin flaps are caught between the pressure from within, and the encrusted, unyielding bandage from without; there is prolonged pressure on the skin flaps, tending to paralyze the terminal filaments, with the result that the flaps lose their tone, integrity and vitality, and an unhealthy condition of the stump frequently appears from this cause with sloughing and necrosis. If there is added to it the burrowing, pent-up, exudate pus, the last stage of the wound becomes worse than the first, and a general infection of the end of the stump follows. If it is possible to hinder or prevent the coagulation or hardening of the blood clotted in the dressings that cover a wound or to secure free drainage at all times, these conditions enumerated above that are productive of irritation would not prevail. There would be free drainage of the exudate at all times. There would be no backing up or plugging up of the wound, no swelling or hydraulic pressure, no irritation from the pent-up, decomposing, irritating oils and fats from the medullary part of the bone, no separating of the layers of the end of the stump. Under these conditions there would be the least amount of irritation in the wound during the process of repair; therefore there would be the least amount of dense, fibrous connective tissue; hence the least amount of contractions with its consequent pain, deformity and possibly keloids. Kirk's Hand Book says:—

"Coagulation is hindered or prevented by the application of oil." The oil treatment of wounds is universal in its application to all wounds and granulating surfaces, and should be employed wherever possible. It is especially applicable to amputations. The stump should be immersed in oil until the redness or discoloration disappears. The treatment of wounds with oil is a time-honored custom, not only spoken of in the earliest writings, but referred to in the Bible as the "Healing Oil."

The success of the featural surgeon in reducing scar tissue has been largely that of applying oil to the wounds. The writer cannot urge too strongly the use of oil in all amputations. He commends it to the medical profession with all the force that language can convey, if the result sought by the surgeon is freedom from dense, fibrous connective tissue, freedom from pain, freedom from deformity, freedom from that maliferous condition known as keloid, if the result sought is peace of mind and body of the patient and a maximum utility of the stump.

It is the practice of the writer to cover the end of the stump with several layers of gauze cut into pieces of about two feet square, on which has been smeared a layer of paraffine and vaseline, an ounce and one-half to the pound. These are melted separately and mixed. The wound itself is covered with sterile vaseline and the mixture on the gauze is laid over this. The heavy mixture on the gauze keeps the vaseline from being absorbed by the dressings and in contact with the wound at all times, for without the heavy mixture on the gauze the vaseline will be absorbed by the dressings at the temperature of the body, and will adhere to the wound after a brief period of time with consequent irritation, as already mentioned, with the resulting tendency to the formation of dense, fibrous connective tissue.

A dressing of this character eliminates the irritation from all the sources above mentioned that occur in a wound through the instrumentality of the clot. The dressing is cheap, easily sterilized by heating, keeps well and absolutely prevents blood clots from forming.

Sterilized white silk, sheet rubber or oil silk may be used in lieu of the paraffine-vaseline preparation in covering the wound. These will not allow the vaseline to soak into the dressing, and for this reason will keep the blood clots from forming. The difficulty at-

tending their use lies largely in the cost and the difficulty of sterilization. The French surgeons do not sew the skin flaps of their amputations till after they are sure that the wound is not infected. They have recognized that in some way amputations differ from other operations, in that they are more liable to be infected. I have discovered why this is so, and why their procedure was successful. They did not know what caused the irritation and why their simple procedure of leaving the wound open was effective in many instances in keeping the wound healthy and free from infection.

The principal cause of intense irritation in the end of the stump is caused by the failure of the surgeons heretofore to recognize the importance of draining the fat and oil from the medullary part of the bone. It is more important to remove it from here than from the superficial tissues.

All drains should be thoroughly lubricated with the paraffine-vaseline preparation before being inserted. Two drains should be employed following an amputation, *one to extend to the medullary part of the bone to drain the fat and oils from there*, and the other to drain the fleshy tissues. When rubber tubing is employed the one to the subcutaneous tissues should be of the fish tail variety; that is, the rubber drain is slit up for three or four inches on one end, and two tails thus made, after being thoroughly lubricated, are laid in different parts of the wound. *The drain to the medullary part of the bone should be straight and sewed to the periosteum with catgut ligature.* This drain will often discharge for several days after the one from the fleshy tissues has ceased. The lubricated drain will keep the exudates in a fluid state and will allow them to escape and be deposited on the dressings by the slightest pressure, where they may be readily removed at the succeeding dressing.

The lubrication on the drain is not the same character as the fats and oils in the wound. Paraffine and vaseline are inert, and will not decompose in the tissues, for when injected into the tissues hypodermically will remain an indefinite period of time with no decomposition. When a drain adheres to the side of the wound the removal at times is so painful as to necessitate the administration of anæsthesia. Extreme cases of this nature, however, more commonly follow abdominal sections than amputations, but still it illustrates the fact that drains do stick or become plugged, and their removal at times causes considerable irritation and pain.

A drain lubricated in the manner above described may be removed with little or no discomfiture, and is not liable to become plugged.

A prescribed time limit for the removal of drains is not productive of the best operative results. Remove each drain only after the exudates from it have ceased. A loose stitch or two should be placed at the drain opening. This is not tied till after the drain has been removed.

At times, in amputations, it may seem advisable to use a part of a flap that has been involved to give a more serviceable or longer stump, or one to which an artificial limb could more easily be attached. Never include involved tissue in a flap. The risk of sloughing is too great. A good short stump is infinitely superior to a poor long one, and an artificial limb can be adjusted to it almost as readily.

The Bier hyperemic treatment is strongly advocated by our best authorities in beginning infections. It is quite generally practiced now as an abortive treatment in incipient troubles, as incipient phlegmons, furuncles, etc., etc. It means so much to have a good stump, that the writer has practiced it successfully as a prophylactic, taking it for granted the wound is infected and applying it immediately after the operation. It should be used only in those cases where the surgeon is reasonably sure there will be no secondary hæmorrhage. It should be used two hours out of twelve the first day, three hours out of twelve the second and four hours out of twelve the third day. Willy Meyers says, in speaking of Bier's hyperemic treatment, "Hyperemic treatment has been found most useful in that it favors the abortion of exudate, and pathologic tissue changes of various kinds."

All wounds should be dressed daily to keep them absolutely free from blood clots. The function of the bandage is merely to keep the dressing in place. It should cause no constriction whatever. The writer uses a wide bandage wrapped loosely. Adhesive plaster should not encircle the limb, but should go down over the end of the stump and up the other side. On the lower limb the loose dressing should be kept from slipping by straps that go over the shoulders like a suspender, or like the strap that holds an artificial limb in place. A towel may be pinned loosely around the waist over these straps, to which they are pinned. On the arm a figure

of eight bandage should go over the neck, thus securing it from slipping.

It is not our object in this paper to deal with specific methods of amputations, but with methods that affect amputations as a whole; but there is one amputation that it is well to mention, where the oil treatment is especially applicable, and that is in amputations of the middle or upper part of the leg. The fibula in this amputation is not an advantage in adjusting an artificial leg. In fact, it may be dispensed with. The only reason for leaving it heretofore is that the dense, fibrous connective tissue or cicatrical tissue is liable to occur. The position of this cicatrix is on the side of the leg just where the artificial limb presses. If the fibula is removed and the wound operated and dressed in the manner above described, there will be little or no dense, fibrous connective tissue.

When a wound is septic in character, stimulation of the tissues is often necessary, but this is always at the risk of stimulating the connective tissue cells to the proliferation of new dense, fibrous connective tissue in the wound.

The oil treatment is particularly well adapted to suppurating surfaces. It is recommended especially aside from the fact that it prevents clotting, and consequent irritation from this cause, because the paraffine and vaseline preparation lends itself readily as a medium for holding or conveying to the surface any medicinal preparation the surgeon may desire or think necessary in the individual case. A thin, oily medium is not as well adapted for this purpose as the beeswax and vaseline preparation, for the thinner oils, as vaseline alone, for example, melts at the temperature of the body, soaks into the dressings and allows them to adhere to the wound.

A preparation for suppurating surfaces that has given good results in the hands of the writer may be made at very small cost and may be used with advantage in many cases of septic surgical dressings. It consists of:

Beeswax	2 oz.
Ichthyol	1 dr.
Balsam of Peru	1 dr.
Pulv. Alum	$\frac{1}{2}$ dr.
Petrolatum, q.s.ad.	1 lb.

The paraffine and vaseline are melted separately and mixed. When cool the other ingredients are then mixed in thoroughly.

Apply to cheese cloth or lint and lay lightly over suppurating surfaces. Dress twice daily, or often enough to insure that it is kept free from the accumulation of pus. This dressing should be employed till the pus disappears. After the pus has disappeared dress in the plain beeswax and vaseline preparation daily until the red discoloration disappears.

Never put an antiseptic or a stimulating preparation or a healing agent in contact with a healthy granulating surface, for the vital forces of the patient that were sufficient to cause the healthy granulation to appear are sufficient to heal the wound properly if irritation is kept out of the wound by the application of the paraffine-vaseline preparation.

Never put anything on a wound but the simple vaseline and paraffine mixture unless it is known to be unhealthy.

In conclusion, the writer would like to state that this technic of amputation in no way interferes with aseptic technic, and when the two are used in conjunction he believes there will be a nearer approach to the ideal toward which we are all striving.

PART II.

Relief of Pain in the Stump.

Modern surgical methods have resulted in fewer amputations than formerly, and most surgeons will fight to the last ditch to avoid them. The operation of amputation is considered simple, so simple, in fact, that many vitally important details of the operation have been overlooked. There are times, however, when it is necessary to amputate, for the ranks of the vast army of cripples is being ever replenished. Besides impeded locomotion, the lives of many of these unfortunates are rendered most unhappy and miserable by an ever-present apparatus of torture in the stump (usually dense, fibrous connective tissue). Their condition is often most pitiful. When a patient, depressed in body and mind, relates his tale of woe to the physician he is offered relief too frequently only in the shape of sympathy.

The writer wishes to emphatically go on record as stating that these conditions are not necessarily a sequel of amputations.

The vast majority of those whose troubles arise primarily from dense, fibrous connective tissue or cicatricial tissue in the stump and can be relieved. The writer has never seen a case of pain arising from dense, fibrous connective tissue but that he was able to relieve it.

The principal causes for pain in a stump are:

1. Dense, fibrous connective tissue scars.
2. Foreign bodies in the end as an offending stitch or a piece of necrotic bone.
3. Insufficient covering of the bone.
4. Neglect.

Scars.

The relief of pains in the stump that arise from dense, fibrous connective tissue consists in removing this tissue.

For the sake of completeness we will take up the various classes of scars and study them and the methods of their removal, with special attention to cicatricial tissue and its relation to the stump. Other conditions causing pain in the stump will be taken up in the order of their importance and the methods of relief from these conditions discussed.

For the purpose of removal the writer has divided all scars into three great classes, depending upon the amount of dense, fibrous connective tissue they contain. This classification is arbitrary and is made for convenience in referring to them. For example:

Scars Under Class One.

Scars under class one contain no dense, fibrous connective tissue, but only loose fibrous or myxomatous connective tissue. They are flexible, pliable and free from pain. They follow deep wounds or granulating surfaces when the wound has healed comparatively free from irritation. These scars are objectionable only from a cosmetic point of view and are of no further interest at present except possibly to add they are removed only by a plastic operation.

Scars Under Class Two.

Scars of the second class occur after superficial injuries or interruptions of the integrity of the skin, where irritation is maintained in the wound during the process of repair. They contain mixo-fibrous and a small amount of dense, fibrous connective tissue.

When the process of healing after a superficial injury is not interfered with, as when the wound is dressed in oil (described above), the proliferating epithelia spreads over the denuded area with *no resulting scar or blemish in the skin*. If, however, the process of healing is interfered with, or irritation is maintained in the wound, the formation of dense, fibrous connective tissue will result and will interfere with the newly formed epithelial cells from the epithelial zone. The result therefore is a conflict between the proliferating newly formed epithelia and the connective tissue cells. Around each duct of the skin appendages, as a focus, new epithelia make their appearance. Between these little bundles of dense, fibrous and myxofibrous tissue are observed and the surface becomes irregular. This is a scar of the second degree. The pittings of smallpox is a good example of scars of this class. These scars are removed by 95 per cent. carbolic acid.

Cicatrices or Scars Under Class Three.

Cicatrices contain only dense, fibrous connective tissue. They follow deep injuries, where irritation is maintained in the wound during the process of repair and are the class of scars that are so objectionable from every point of view. A recent cicatrix is firmer, less pliable, and less yielding than the surrounding parts. After a period of time it may become flexible, pliable, and easily movable, losing its adhesion to the fascia and bone in many cases.

An old cicatrix often assumes a pearly whiteness. When large they are often exquisitely painful, the pain at times persisting for forty or fifty years.

A cicatrix contains no papillæ, nerves, lymphatics, muscular or granular tissue.

They may be either level with the adjacent tissue, elevated, or depressed.

There are a number of methods of treating dense, fibrous connective tissue that will in a measure lessen the amount in a scar, even though it be of long standing.

Scars of class three may often be removed by operative procedure, as are scars of class one, but, in class three, the incisions are deeper. The incision must be wide and deep enough to include all of the dense, fibrous connective tissue, and of such form as to

allow the skin to be drawn over it. The deeper tissues are not so elastic as the superficial and consequently the difficulties in accurately approximating the skin edges are greater. The sliding flap method of wound closure must often be used and the two-stage and sometimes the three-stage method of operation must be resorted to. The dressing of the wound is the same as after all surgical operations.

Cicatrices or scars of the third degree that are raised above the surrounding skin surface may be burned off with nitric acid or aqua regia. After an application of from five to twenty seconds ordinary bicarbonate of soda is applied as a controlling agent to prevent deeper penetration. The wound should then be dressed with the paraffine-vaseline preparation until healing takes place, and if all the dense tissue has been burned sufficiently the resulting scar will be found to be softer and with markedly less dense, fibrous connective tissue, or it will contain loose fibrous or myxomatous connective tissue.

To remove a small scar of the third degree, as from a stitch or line scar, blister it with pure carbolic acid three or four times, and dressing it with oil is all that is necessary in many instances to completely obliterate it.

In removing a scar with acid, the peculiar phenomenon is often encountered of not being able to sear the skin with the acid. I have applied pure carbolic daily for six days, and covered each application with adhesive plaster, with no evidence whatever of the acid on the skin except a slight hyperemia. The reason for this is that the scar has been previously soaked in oil. It is well to pause here and state that before applying any acid to a scar for the purpose of searing or blistering it the surface should be previously thoroughly cleansed with green soap, ether and alcohol, for the purpose of removing the oils and fats that may have spread over it from the adjacent tissue that prevent the acid from attacking it.

Denuding the scar and the adjacent skin with carbolic acid and dressing it in oil allows the epithelia to spread out over the scar from the periphery. After a line scar has been treated with the acid, and the application of oil is being made, it is very beautiful to see the skin gradually bridging over the line from the edges first in one place, then in another, and so on till the whole scar is covered with new epithelia. If in any place the epithelia fail to com-

pletely bridge over the denuded area from each side, blister that place again and treat with oil in the same manner. Linear scars one-quarter of an inch or more in width are greatly improved, and scars one-eighth of an inch or less in width and stitch scars have apparently been obliterated.

Scars of the third class are poorly nourished. In time the blood vessels in the immediate vicinity cause more or less absorption of the dense, fibrous connective tissue and the scar becomes softer. The absorption may be hastened by causing a mild congestion around the scar in the immediate vicinity.

The galvanic current will do much towards softening and absorbing dense, fibrous connective tissue. At first this treatment may be given once a week or even oftener, and as the scar improves the intervals may be lengthened until once in three months may be sufficient to keep the scar thoroughly suffused with blood.

The writer has used massage with vaseline after static electricity with good results. There have been reported numerous examples where vibration alone has succeeded in causing dense, fibrous connective tissue to be absorbed.

Keloids.

In all newly formed dense, fibrous connective tissue, as scars of the third class, contractions take place, puckering the scars and causing a deformity in the adjacent tissues. Terminal nerve filaments are caught in the cicatrix; the tension on them causes intense and persistent pain. This is the most common cause of pain in the stump. It is at times called neuralgia of the stump and but few stumps are without it more or less. In many instances these contractions are of sufficient force as to cause the inelastic dense connective tissue fibres to separate. In some cases where irritation is maintained in the wound the formation of dense, fibrous connective tissue does not stop at the point necessary for complete union, the normal balance in the different tissues comprising the structure in and around the wound is disturbed, there is an hypertrophy of connective tissue, a new growth of the fibroma type or what is commonly known as keloid.

After a complete excision of a keloid there is often a recurrence. Following the incision there is formation of new dense, fibrous connective tissue and there are the same conditions prevailing then

that were present before the excision, contractions taking place as before, and we say that there is a recurrence of the keloid. If, after a complete excision of a keloid, sliding flaps are used to close the wound properly and the wound, operated after the sense of this paper, is dressed with the simple paraffine-vaseline preparation, there will be no return of the keloid. Some keloids are not operable and of course this treatment does not apply to them.

The amount of dense fibrous connective tissue there is in a scar is usually in direct proportion to the amount of irritation there was in the wound, although some individuals and races seem to have a pre-disposition or an idiosyncrasy for its formation that is not well understood, and, as keloids have their origin in dense, fibrous connective tissue, keloid formation, generally speaking, will be in the same relative ratio.

There is often a very large amount of dense, fibrous connective tissue in the end of a stump. Frequently there are great bands or bridles of dense tissue crossing and re-crossing the scars at various angles, distorting the adjacent tissues by their contractions and pain till the existence of the patient is made well nigh unendurable.

There are other therapeutic resources at our command with which we may meet the condition of pain due to dense, fibrous connective tissue in the stump which meets it effectually. The writer lays no claim to originality in this method of procedure, but he does claim to have had satisfactory results with his cases when it has been followed faithfully. The treatment consists of administering thiosinamine per os and fibrolysin locally hypodermically. The action of fibrolysin on dense fibrous connective tissue in the writer's hands has seldom failed to give relief. The cicatrix while retaining practically the appearance it had before its administration becomes softer in texture, releasing the tension on the nerve filaments, checking the pain.

The following case illustrates the method the writer has used many times successfully:

Mr. M., age fifty-four years, first seen July 10th. History: Had left arm amputated at shoulder a year ago. When first seen there was a large irregular cicatrix about the size of the hand. At its upper extremity there was a band or bridle of dense scar tissue three-quarters of an inch wide, transversing the area horizontally, two or three deep seams or sulci were present that had bony attach-

ments. The seams were discharging. A diagnosis of extensive keloid was made. Extending to the lower extremity was a broad, wide, perpendicular cicatrix three-quarters of an inch wide at the upper extremity, tapering to a line at the lower end. It was three inches long, hard and very tender. It was puckered and the surrounding tissue was drawn and distorted; in fact, the whole shoulder was so painful the patient would allow no one to approach it. He complained of constant pain, worse at night, worse before storms or changes of the weather. His countenance was drawn and he had the anxious expression of one who is suffering.

A hypodermic injection of one ampule of fibrolysin was made into the dense, fibrous tissue. The injection appeared to give him some pain, but it was of only a minute's duration. In ten seconds after the injection the patient spoke of a metallic taste in the mouth; some others described it as similar to garlic. This always occurs, but it passes away in about ten seconds and is not objectionable. The patient was given one hundred one-grain tablets of thiosinamine with instructions to take one tablet one-half hour before each meal and to report again for treatment in a week. The wound was dressed with vaseline and instructions given him to continue it. In this instance white silk was placed over the vaseline to keep it in contact with the wound and from being absorbed by the gauze dressing at the temperature of the body.

On July 17th he reported again. The site of the former injection was sloughing. The heavy band of dense tissue was not nearly so tense and drawn. He said he felt better.

On August 7th he reported again and received the same treatment. There was sloughing wherever the hypodermic injection of fibrolysin had been made. He said he was very much better. On August 10th the same treatment was given, he taking during all the intervals one grain thiosinamine T. I. D. before meals. This treatment was continued for six weeks or till Sept. 24, when the patient said he was free from pain, could sleep at night, something he could not do for months before. The dense tissue where the fibrolysin had been injected had sloughed and the bundles of dense, fibrous tissue became softer and less elevated. Where the fibrolysin was not injected the dense, fibrous connective tissue was very much softer and more pliable.

The history of all other cases is practically the same.

Bier's hyperemic treatment or the use of Rogers' therapeutic lamp, undoubtedly would hasten the absorption of dense, fibrous tissue if persisted in for some months. Even immersing the stump alternately in hot and cold water would cause a congestion that would favor absorption of dense, fibrous tissue, in the end of the stump.

A cicatrix that is attached to the bone is a most painful, nagging and soul-trying condition. The pain from this source will often never cease of itself. Good results are reported to have followed its subcutaneous separation from the bone with a blunt-pointed bistoury. Except only when there is very small attachment profound anesthesia should be employed and the end of the bone removed.

Cosmetics of the Stump.

Tenderness and irritation of stumps that have been comparatively free from pain for a time may frequently be traced to lack of proper care or cleanliness. The creases or clefts not visible to the patient often become impacted with sebaceous material, lint and dust from clothing.

The stump should be cleansed at least once a day with soap and water. A small soft brush will often enable a patient to clean the deeper fissures that are not so accessible otherwise. Bathing the end of the stump twice a week with dilute alcohol is recommended; first, because it dissolves out the sebaceous excretions that tend to collect; second, it hardens the tissues, rendering them more impervious to the corroding action of the foreign material.

A continuous application of the simple paraffine-vaseline preparation with no other treatment will often afford relief from the contractive pains of dense, fibrous connective tissue. A varying length of time is needed, however, depending upon the amount of dense, fibrous connective tissue present. The time necessary is long, much longer than some of the other methods described of removing this condition. The tendency is to soften the dense scar tissue and reduce the pain. It is a home remedy, one the patient can attend to himself, and if persisted in continuously will often afford relief from this painful condition.

Sinuses and Fistulas of the Stump.

The cause of sinuses and fistulas in the stump may generally be traced to either one of two conditions—an offending stitch, or the

presence of necrotic bone. The wall of a sinus is composed of a pyogenic membrane which must be thoroughly removed together with the primary cause before healing takes place. Before exploring the end of the stump with an open incision to determine the cause of the sinus, it is well to curette the wound thoroughly. At times this is all that is needed.

If an area of necrotic bone is present, the curette will assist in detecting it or in determining its presence.

When an extensive segment of the bone is involved it is necessary to go well above it into healthy tissue in a re-amputation.

233 Lexington Ave.

A QUIZ ON THE ORGANON MADE EASY BY "A CONCORDANCE OF THE ORGANON OF THE ART OF HEALING."

By Reginald Barclay Leach, M. D., Faris, Texas.

What *diseases* are mentioned by Hahnemann in the following paragraphs and lines (figures to the left of the decimal designate the *paragraph*; those to the right of the point distinguish the line): — 38.43 — 80.17 — 46.20 — 206.4 — 80.21 — 216.6 and 73.34?

What *drugs* are mentioned in the following:—221.8 — 59.30 — 74.8 — 221.9 — 271.1 — 234.1 — 234.8 and 59.81?

What *divisions* of the human anatomy does he mention in the following:—46.87 — 290.7 — 38.10 — 201.22 — 57.14 — 189.60 — 46.87 and 291.3?

What *authors* are quoted in the following paragraphs and lines:— 46.70 — 39.43 — 36.12 and 38.52?

What *colors* does Hahnemann refer to in the following:—125.4 — 73.32 and 40.40?

What *causes* of *disease* are to be found mentioned in the following:—77.2 — 225.6 — 240.4 — 110.16 — 221.2 and 278.12?

What *divisions* of *time* are referred to in the following:—61.16 — 170.4 — 39.39 and 247.10?

What *conditions*, calling for the manual interference of surgery, are mentioned in the following:—80.17 — 186.12 and 186.24?

What Book of the Bible are you reminded of by a certain word in 119.11 — 32.3 — 69.11 and 275.10?

What words, appearing in 86.4 — 102.1 and 39.31, remind you of "the three Rs" of your youth?

What deplorable habit of many druggists is mentioned in 261.4?

What word, appearing in 115.3 — 57.5 and 61.5, (and in several places in the Preface to the Organon) is mistranslated, and means just exactly the opposite?

What word, appearing in 119.12, is a palpable typographical error—having one letter too many (in its exact middle)?

The following are:—

Some of the various methods of cure, mentioned by Hahnemann in the Organon, to be found in the following:—35.5 — 208.9 — 186.9 — 252.6 and 54.2.

Some of the various *preventives* of disease, mentioned, to be found in the following:—5.2 — 228.5 — 77.9 and 36.10.

Some of the various *implements* of the surgeon are mentioned in the following:—59.63 — 203.8 — 60.7 — 216.19 and 65.4.

Some of the *functions* of the *mind*, mentioned in the Organon, are to be found in the following:—88.4 — 83.3 and 15.13.

Some of the *acts* of the *mind* are mentioned in the following:—258.7 — 95.12 — 274.8 — 58.1 and 20.3.

The trinity of *divisions* of our immaterial economy are mentioned in the following:—5.9 — 226.2 and 229.12.

The author of "A Concordance of the Organon of the Art of Healing" believes his work to be *flawless*; *i. e.*, he believes that not one word of the 24,719 comprising the 292 paragraphs of the Organon (with 17 exceptions, like a, an, and, the, if, etc.) has been omitted from this Concordance. He has so faithfully tried to produce a perfect work, and so much desires a perfect work, that he offers to divide equally the entire *net proceeds* from the sale of the first 1,000 copies of the Concordance between the first three bona fide owners of this work who find and report *omitted* from this work *any* word (not excepted) appearing within the 121 pages of the Organon (proper) as a part of 292 paragraphs therein. This offer holds good for one year from date of publication.

The price is \$1.50 per copy. Order *now* from Dr. W. A. Dewey, Ann Arbor, Mich.

EDITORIAL

A CONCORDANCE OF HAHNEMANN'S ORGANON.

The Editor takes pleasure in announcing to the readers of the CHIRONIAN that Dr. Reginald Barclay Leach, of Paris, Texas, has compiled a *Concordance of Hahnemann's Organon*. As soon as Dr. Leach has three hundred and fifty subscribers at \$1.50 each the book will be published. The editor knows Dr. Leach well, is a warm admirer of his, and believes him to be one of the best posted men on Hahnemann's writings alive today. He has seen some of the manuscript of Dr. Leach's *Concordance*, and knows that the work has been well done. It is to be hoped that the three hundred and fifty subscribers necessary to guarantee the publication of the book will be promptly forthcoming. Subscriptions should be sent to Dr. W. A. Dewey, Ann Arbor, Michigan.

WORK AT THE FLOWER HOSPITAL FOR THE MONTH OF NOVEMBER, 1910.

Number of ambulance calls.....	556
Number of patients treated in the emergency room.....	267
Number of surgical cases admitted to hospital.....	213
Number of medical cases admitted to hospital.....	87
Number of maternity cases admitted to hospital.....	5
Number of cases treated at the out-door department.....	3,294

The greatest number of patients in the hospital in any one day was 131.

THE FLOWER HOSPITAL TRAINING SCHOOL.

The Training School at present comprises thirty-nine capped nurses and ten probationers. Two of this number are members of the class of 1910, who will complete their course within the next month. Thirteen are members of the present Senior class, ten of the Intermediate; the remaining members being capped Juniors and probationers. Six more probationers are to enter on December fifteenth, for the Training School is growing in proportion to the growing need of the hospital.

There is a reception room in the Nurses' Home, where the nurses hold small informal parties. The use of one of the college rooms is allowed for large gatherings, the most recent being a Hallowe'en party.

The character of the work at the Flower Hospital may be gathered from the statement printed elsewhere in the *CHIRONIAN*.

THE FLOWER HOSPITAL AUXILIARY.

In submitting this, my first report, I would like to say that The Flower Hospital Auxiliary has been unusually fortunate in having been assisted in their sewing by the Guilds of several Churches, and their interest in the work has been aroused to such an extent that they are ready and willing to take up the work again.

A call for five hundred babies' night dresses came in last January, and the garments were made up in ten days by the Guild of St. Ann's Church in the Bronx.

During Lent several hundred garments were made by the Guilds of different Episcopal Churches through the Bronx Parish House.

Easter Monday two ambulance loads of potted plants were taken down from St. Luke's Church to Flower Hospital for the patients.

The Treasurer's report, showing a gain of over six hundred dollars, is a very encouraging one, and I want to take this opportunity to thank the members who have worked so faithfully, for it is due to their untiring efforts that we have been able to accomplish so much in so short a time.

Notwithstanding the many and urgent appeals for help which are constantly coming in to us, and which, at times, seem almost more than we are able to cope with, we are working hard to raise the balance of the fifteen hundred dollars, the cost of the refrigerating plant. Calls have also come in for bedding, linens, china, etc., which we hope to take care of.

In order that the men as well as the women might have an opportunity of helping in this great work, I changed the name of The Women's Auxiliary of Flower Hospital to The Flower Hospital Auxiliary.

A cordial invitation is extended to you and your friends to be-

come members, either honorary, associate or active, of this Auxiliary, thereby enabling us to do still more for our beloved hospital.

Faithfully yours,

KATHARINE D. STORER.

Officers (1910-1911).

President, Mrs. John Hudson Storer; Vice-Presidents, Mrs. George B. Howe, Mrs. Melbert B. Cary, Mrs. Royal S. Copeland, Mrs. William Tod Helmuth, Jr., Mrs. J. T. Simonson, Mrs. John E. Wilson, Mrs. Walter Gray Crump, Mrs. Edward G. Tuttle; Treasurer, Mrs. Daniel E. S. Coleman; Recording Secretary, Mrs. E. Wilton Brown; Corresponding Secretary, Mrs. Howard Diehl; Auditor, Dr. John William Dowling. Chairman Membership Committee, Mrs. J. S. Gaines; Chairman Entertainment Committee, Mrs. Alice L. Spalding; Chairman Press Committee, Miss Lou Van Wyck; Chairman Printing Committee, Miss Gould; Nominating Committee, Mrs. E. H. Hammer, Mrs. Ethel Southerack, Mrs. James B. Gear.

Financial Report.

THE FLOWER HOSPITAL AUXILIARY, JANUARY 1, 1909, TO JANUARY 1, 1910. MRS. GEORGE W. McDOWELL, TREASURER.

RECEIPTS.

Proceeds from February Concert (net).....	\$163.00
Membership Dues collected	179.00
Miss Harriet Keith Fobes' Linen Shower.....	17.00
	\$359.00

DISBURSEMENTS.

Printing, Stationery, Stamps, etc., as per items..	\$20.01
Mrs. Deady's traveling expenses in Settlement	
Work	25.00
Check sent to Dr. Hornby for Hospital linen....	100.00
Miss Fobes' Linen Shower Donation	17.00
Check for Diet Kitchen (stove, painting kitchen, pantry ceiling, lecture room, renovating furniture in reception room)	150.00
Balance on hand, January 1, 1910	46.99
	\$359.00

THE FLOWER HOSPITAL AUXILIARY, JANUARY 1, 1910, TO NOVEMBER 18TH, 1910. MISS FLORENCE I. GILDERSLEEVE, TREASURER.

RECEIPTS.

Balance on hand, January 1, 1910	\$46.99
Miss Florence I. Gildersleeve's cake sale.....	101.00
Mrs. Alice L. Spalding's bridge and euchre, to which Mrs. Anson P. Flower donated \$100.00	
Miss C. M. Prior	25.00
	————— 490.75
Membership Dues collected to date	266.00
	————— \$904.74

DISBURSEMENTS.

Printing, Stationery, Postage, etc., as per items	\$52.73
Reception at Manhattan Hotel	150.00
Check to Flower Hospital towards Refrigeration	
Plant	400.00
Balance on hand, November 18th, 1910..	302.01
	————— \$904.74

THE FLOWER HOSPITAL AUXILIARY, NOVEMBER 18TH, 1910, TO DECEMBER 1, 1910. MRS. D. E. S. COLEMAN, TREASURER.

RECEIPTS.

Balance on hand, November 18, 1910	\$302.01
Cake Raffle	5.00
Mrs. Alice L. Spalding's bridge and euchre (net)	275.00
Membership Dues collected to date	79.00
	————— \$661.01

DISBURSEMENTS.

Printing, Stationery, Stamps, etc., as per items ..	\$9.15
Balance on hand, December 1, 1910	651.86
	————— \$661.01

Respectfully submitted,

(MRS. D. E. S.) ELIZABETH RUSSEL COLEMAN.

New York, December 2, 1910.

NEW YORK HOMŒOPATHIC MATERIA MEDICA SOCIETY.

The November meeting of the N. Y. Homœopathic Materia Medica Society was held on the 23d at the residence of Dr. Wallace

B. House, 135 W. 78th street. A paper was presented by Dr. Walter Sands Mills on "Pneumonia" that was teeming with good points in symptomatology and physical signs. The discussion of the remedies was opened by Drs. W. H. Freeman and D. E. S. Coleman. The interest shown in the general discussion by the members proves the wisdom of discussing diseases along with the remedies. The refreshments were delicious.

The next meeting will be held at the residence of Dr. O. R. von Bonnewitz, No. 2030 Broadway, corner 70th street, December 28th.

Papers to be discussed:

"Relation of Homœopathy to Bacterial Therapeutics," Dr. George F. Laidlaw.

"A Dissection of Homœopathic Philosophy," Dr. C. H. Duncan.

This will be a rousing meeting and you should keep this evening open if you are a member, and if you are not, join at once.

O. R. VON BONNEWITZ, M. D., *Secretary*.

OCTOBER MEETING ACADEMY OF PATHOLOGICAL SCIENCE.

At the regular October meeting of the Academy of Pathological Science a case of medullary carcinoma of the stomach was reported by Dr. J. Perry Seward.

Patient, male, age 51, with negative family history as to carcinomata. His trade was color mixer for wall papers. Had smoked tobacco but never used intoxicating liquor. No venereal history. Sick for six weeks with vomiting after each meal. Pain in epigastrium extending through to back. Some eructations, which put teeth on edge. Vomitus of chocolate color. Had lost 21 pounds in six weeks.

Examination showed head and thoracic organs negative. Liver enlarged. Hepatic region tender with firmness of abdominal wall over enlarged portion. Small palpable mass in epigastrium and tenderness over that area. Moderate ascites. The history was that of sudden onset and rapid progress of disease. Ewald test breakfast showed undigested food of sour odor. Total acidity of 50 with no free HCl. Considerable lactic acid. One month later the test breakfast showed more markedly the effects of stagnation due to stenosis.

Patient died three months after first symptoms of gastric trouble developed. The day before death there was only moderate ascites, but after death ascites and œdema showed markedly.

Autopsy.—Primary medullary carcinoma of the stomach with secondary carcinomata of head of pancreas, in the liver and neighboring peritoneum. A granular nephritis, thrombosis in the right femoral artery and end stage congestion and œdema of both lower lobes of the lung presented.

Dr. Stow discussed the paper, and in the discussion he differentiated the carcinomata of the stomach. Chronic gastritis was given as a prominent etiological factor of carcinomata of the stomach. The scirrhus type often cures itself by the increase in connective tissue which gradually shuts off the blood supply, thus causing its own death by stagnation.

Dr. Stow stated that he had often seen as an early indication of carcinoma of the stomach an involvement of the lymphatics of the left claviclar region, being transmitted through the thoracic duct.

Several microscopical specimens of gastric carcinomata were presented.

The second paper of the evening was given by Dr. Sleght, it being A Report on Carcinoma.

The primary tumor occurred in Scarfa's triangle of the right thigh. The growth has extended and attacked the labia, mons veneris, and is now reaching over to the left side.

Dr. Sleght quoted the statistics of fatalities from carcinoma in New York City in the past year as 724 males, 1,336 females, and in the United States for the same period, 11,346 males, 18,339 females.

The paper was discussed by Dr. Couch.

The third paper was presented by Dr. Fobes: Varicose Veins and Their Treatment.

Dr. Fobes spoke of the surgical treatment after the valves had broken down. The Mayo method was advised, using the "stripper" to free the vein from its surrounding structures.

Directions for use: Make incision over the vein at its upper limit of removal. Tie off vein with double suture and sever. Thread the vein to be removed through the eye of the stripper. Pass stripper down along course of vein and make incision over "pointing," shown by eye of stripper for removal of freed vein.

The paper was discussed by Drs. Kaufman, Duncan, Stewart and Couch.

Fourth paper: Early Stage of Paresis, was presented by Dr. Turner. The present condition of the patient was given, and while he is now improving a downward trend is sure to come. Some of the symptoms present are: Sluggish pupils, stuttering during conversation, poor co-ordination, memory not good.

Dr. Sprague Carleton presented some thoughts in the use of "606" and mercury in syphilis.

Meeting adjourned.

WILLIAM McLEAN, *Secretary*.

NOVEMBER MEETING OF THE ACADEMY OF PATHOLOGICAL SCIENCE.

The president, Dr. Dieffenbach, said that he felt very grateful for the support given him by the members; during the past year they have had some profitable meetings, and the Society has prospered. During his incumbency it had appeared to him that it would be advisable to resume a feature supported in past years and have the report of the proceedings appear in the CHIRONIAN. Dr. Mills, who is now in charge of that journal, is quite anxious to publish the Transactions, and if some one would make a motion to have the Transactions printed, he thought it would be an advantage to the Society and a help to the CHIRONIAN.

Moved; seconded; carried.

The following officers were elected for the ensuing year: President, Dr. J. H. Fobes; vice-president, Dr. Walter G. Crump; corresponding secretary, Dr. Wm. McLean; recording secretary, Dr. H. C. Sayre; pathologist, Dr. H. G. Sloat; curator, Dr. C. J. Miller.

Papers were presented by Dr. Heitzman, Dr. Duncan, Dr. Boyle and Dr. Stow. The first two appear elsewhere in this number of the CHIRONIAN. The papers of Dr. Boyle and Dr. Stow will appear in some later issue.

The CHIRONIAN takes pleasure in announcing that the proceedings of the Academy of Pathological Science will appear in it from now on.

OBITUARY.

Dr. Emily V. Pardee-Disbrow.

Dr. Emily Virginia Dowd Pardee-Disbrow, of South Norwalk, Conn., died in November at the Hahnemann Hospital in New York after a long illness. Dr. Pardee-Disbrow was born in Madison, Conn., October 29, 1841. At the age of 20, as Miss Emily Virginia Dowd, she became assistant principal of the high school at South Norwalk, Conn. She resigned from that position to establish a private school. In 1865 Miss Dowd married Dr. Moses Burton Pardee, a prominent allopathic physician of South Norwalk. Some years later Mrs. Pardee studied medicine, and 1875 was graduated with honors from the N. Y. Med. Coll. and Hosp. for Women (homœopathic). She soon attained the largest and most profitable practice in South Norwalk. To distinguish her from her husband she became familiarly and lovingly known as Dr. Emily, and was so known locally till her death. Some time after beginning practice Dr. Emily, the homœopath, called her husband Dr. Pardee, the allopath, in consultation. For this heinous crime, consulting with a homœopathic physician, Dr. Moses Pardee was expelled from the Connecticut Medical Society. In 1893 Dr. Moses Pardee died. In 1896 Dr. Emily became professor of pediatrics in her Alma Mater. In 1902 Dr. Emily married Mr. David Ellis Disbrow, a musician, who survives her. She also left three children, Miss Mary Field Pardee, teacher of German at the Ethical Culture School in New York; Dr. M. Clifford Pardee, of Brooklyn, and Mr. Munson D. Pardee, of the New York *World*.

Dr. Emily Pardee was a member of the American Institute of Homœopathy, and for many years was a regular attendant at its sessions. In 1893 she was a Connecticut delegate to the World's Medical Congress at Chicago, and was chief of the Bureau of Diseases of Children. She was an active member of the Connecticut Homœopathic Medical Society, and had been vice-president. She was a member of Sorosis and active in the cause of woman suffrage. She also belonged to many charitable and religious organizations.

Dr. Pardee-Disbrow was a woman of charming personality, of great intellectual vigor and of keen wit and a fine speaker. Those who heard her speak at the fiftieth anniversary of the Homœopathic Medical Society of the County of New York will never forget the

treat she gave. It was one of the best after dinner speeches, and held her audience from beginning to end.

BROOKLYN NOTES.

GEORGE ASBURY DEWEY, M. D.

George Asbury Dewey, a resident of Brooklyn since 1868, and a retired homœopathic physician, who was the first to introduce that school of practice into the northern part of this State, going to Plattsburg in 1855 from Cleveland, Ohio, where he graduated from the Western Reserve University in 1849, died Tuesday, November 1, 1910, at his residence, 319 Putnam avenue. He was born at Chelsea, Vt., August 22, 1828, and was the son of Royal and Nancy Dewey. He was a distant relative of Admiral Dewey. He practiced in South Brooklyn until his retirement many years ago. During the Civil War he acted as physician and surgeon at Fortress Monroe, and on board hospital ships, and when the Spanish War broke out offered his services as a surgeon. His age caused a declination of the offer. He was a Freemason and a member of the Classon Avenue Presbyterian church, and formerly had belonged to several medical societies. He leaves two sons, Charles F. and Julius A., and a daughter, Mrs. William C. Buckley.

The seventh annual dinner of the Alumni Association of the Cumberland Street and Brooklyn Homœopathic Hospital was held November 4th at the Clarendon Hotel. More than sixty physicians were gathered about the banquet table in the large dining hall.

Dr. John L. Moffat, the president of the association, was toastmaster during the evening. Among the speakers were Dr. John E. Wilson, of Manhattan; the Rev. Julian Kennedy Smyth, of Manhattan; Dr. Royal S. Copeland, of Manhattan; Dr. John C. MacEvitt, of Brooklyn; M. J. Drummond, charities commissioner; Dr. T. L. Fogerty, deputy commissioner of charities, and Dr. John F. Fitzgerald, general medical superintendent. An orchestra gave several selections. On the committee of arrangements were Dr. Alfred Bornaman, chairman; Dr. E. R. Bedford and Dr. Alton G. Warner. The souvenirs of the evening were small postage weight scales.

Our September notes seem to have miscarried. In that month Dr. Ralph G. Yeaton, '09, was stricken with appendicitis on the eve of sailing for the Argentine Republic. He was taken to the

Prospect Heights Hospital and operated upon by Dr. S. W. Pallister, and has made a slow but good recovery. He recommends the Fowler position and Murphy's enteroclysis for those who need something to occupy their minds.

ROBERT LOWELL WOOD.

WASHINGTON NOTES.

Dr. Ira W. Dennison announces the removal of his office to the Wyoming Apartments, Washington, D. C. His office hours are 8 to 10 A. M. and 4 to 6 P. M. The doctor journeyed to his home in Connecticut on election day to cast a vote for Judge Baldwin and incidentally to visit his parents.

The annual meeting of the Washington Homœopathic Medical Society will be held on Saturday evening, December 10th. An extraordinarily good meeting is expected.

The Southern Homœopathic Medical Association will hold its annual meeting at Jacksonville, Fla., on December 6th, 7th and 8th. This association has sprung into new life in the past two years, and is developing again into a strong society.

The Chiron Club, of Washington, held its November meeting at the home of Dr. Birdsall. The object of this little club is to discuss current medical topics and progressive medicine.

G. C. BIRDSALL.

JUNIOR CLASS NOTES.

The monthly meeting of the class was held November 4, 1910, and the following officers elected for the coming year: President, J. R. Honiss; Vice-President, W. F. Wood; Secretary, L. A. Dickinson; Treasurer, R. W. Harris; Senators, B. F. D. Norwood, E. B. Stedman; Class Historian, W. F. Shaw.

The Junior Prom. Committee, consisting of W. P. Bergen, W. F. Wood, H. S. DuCret, T. L. DuPuy and the president ex-officio, already has plans under way for what is hoped will be the best dance in the history of Alma Mater. It will be held either at Delmonico's or the Plaza, and the probable date is February 10, 1911. It is to be the especial effort of the committee to make the affair attractive to the alumni as well as the undergraduates, and to make possible some class reunions which otherwise will not take place.

J. R. HONISS, 1912.

BOOK REVIEW.

LIPPINCOTT'S NEW MEDICAL DICTIONARY. A Vocabulary of the Terms Used in Medicine and the Allied Sciences, With Their Pronunciation, Etymology, and Signification, Including Much Collateral Information of a Descriptive and Encyclopædic Character. By Henry W. Cattell, A. M. (Lat.), M. D. (U. of P.), Editor of International Clinics, Fellow of the College of Physicians of Philadelphia, etc. Octavo. 1,108 pages. Freely illustrated with figures in the text. Flexible leather, thumb indexed, \$5.00, net.

This is a new dictionary, in fact, as well as in name. It includes the many new terms that have sprung up in bacteriology and the allied sciences. It tells about Wassermann's reaction, it tells about Noguè's modification of it. It describes Ehrlich's side chain theory of immunity. It gives the theory of opsonins. It describes pellagra, its geographical distribution, etc. The drugs of the last revision of the United States Pharmacopœia are given. The homeopathic drugs are listed, even if not in the United States Pharmacopœia. Some of the most frequently used proprietary medicines, like Listerine, can also be found defined.

The definitions are concise, but clear. Cross references abound. Illustrations are scattered throughout the text, adding greatly to the value of the book. Many plants and a number of likenesses of distinguished investigations also appear; for example, Lister, Rush, Jenner, etc.

The printing is good, the book well made. It gives the etymology at the end of the definition. The book is a guide to capitalization and hyphenation. The spelling is conservative. The new abbreviated, simplified spelling is not used.

The first book that a medical student needs is a medical dictionary. Later, as a practitioner, the student needs an occasional new and up-to-date dictionary. This is especially true now when so many new things are constantly being put forward. The dictionary of a decade ago has little value now. For these reasons this new medical dictionary should find its way to the desks of many—students and practitioners alike. The reviewer knows of none better.